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A.M.A. SESSION • ATLANTIC CITY, N. J. • JUNE 7-11, 1937

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THE PROBLEM OF CANCER OF THE PANCREAS

CHAIRMAN'S ADDRESS

HOWARD M. CLUTE, M.D.

BOSTON

Recent surgical literature has contained an increasing number of contributions relating to the surgery of the noninflammatory lesions of the pancreas. The discovery that tumors of the islands of Langerhans could cause hyperinsulinism was followed by reports of the successful surgical removal of these small tumors from the pancreas by Roscoe Graham,[1] Judd [2] and Whipple and his associates,[3] and subtotal pancreatectomy for hyperinsulinism has recently been reported by Evarts Graham [4] and McCaughan.[5] New interest has been directed to the radical surgery of the pancreas by reports of successful removal of malignant tumors involving the papilla of Vater by Judd,[6] Walters,[7] Potter,[8] Hunt,[9] Whipple and his associates [3] and by the occasional reports of the radical removal of malignant growths involving the body or tail of the pancreas, which likewise have appeared in the literature.[10]

It would appear most opportune at this time, therefore, to present to this section a brief review from the literature and from personal experience of the symptomatology, and especially the early symptomatology, of cancer of the pancreas, and to discuss the problems that are involved in the surgical attack on this lesion. I have not had the opportunity of carrying out the procedures to be considered save in the autopsy room. It is hoped however that, by directing the attention of this group of surgeons to the problem of cancer of the pancreas, further progress in the management of this disease will be made.

INCIDENCE

Cancer of the pancreas is by no means a rare disease. Bigelow and Lombard [11] found that 4.8 per cent of the cancer deaths in Massachusetts hospitals in 1928 to 1930 were due to cancer of the pancreas. Hoffman,[13] in a statistical study of cancer of the pancreas, says it is safe to assume that 3 per cent of all cancer deaths arise from cancer of the pancreas and total 4,000 a year in the United States.

PATHOLOGY

The malignant process in the pancreas may originate in the parenchyma of the gland, in the pancreatic ducts, or rarely in the islands of Langerhans. The most frequent type of tumor is adenocarcinoma, although scirrhous forms are not infrequent. Most pancreatic cancers are primary in the pancreas, but a very few are primary in the biliary tract or duodenum and invade the pancreas secondarily.

The tumor is most frequently located in the head of the gland. In a series of 678 cases collected from the literature by Leven,[14] 56.3 per cent were in the head of the gland and 30.7 per cent were diffusely spread through the pancreas. Only 6.6 per cent were limited to the tail of the pancreas and 6.3 per cent to the body; 87 per cent are in the head or are diffuse and so are least subject to surgical attack.

METASTASES

Pancreatic cancer may metastasize by (1) direct extension into contiguous organs, (2) growth through the lymphatics or (3) invasion through the adjacent blood vessels. To the surgeon the rapidity with which these tumors metastasize is most important, and in general it may be said that most pancreatic cancers form metastases within a few months after they are discovered. In one personal experience with a small tumor in the head of the pancreas extensive metastases to the liver were present five months after the original exploration had shown no evidence of any extension of the growth. All are familiar, however, with other exceptional cases in which the appearance of metastases has been delayed for months or years. Thus, in my experience, one man lived four and a half years after cholecystogastrostomy before evidence of metastasis was noted.

Read before the Section on Surgery, General and Abdominal, at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 14, 1936.

1. Graham, Roscoe, cited in Howland, Goldwin; Campbell, W. R.; Maltby, E. J., and Robinson, W. L.: Dysinsulinism; Convulsions and Coma Due to Islet Cell Tumor of the Pancreas with Operation and Cure, J. A. M. A. **93**: 674-679 (Aug. 31) 1929; account of operation, p. 677.
2. Judd, E. S.; Allan, F. N., and Rynearson, E. H.: Hyperinsulinism; Its Surgical Treatment, J. A. M. A. **101**: 99-102 (July 8) 1933.
3. Whipple, A. O.; Parsons, W. B., and Mullins, C. R.: Treatment of Carcinoma of the Ampulla of Vater, Ann. Surg. **102**: 763-779 (Oct.) 1935.
4. Graham, E. A., and Womack, N. A.: The Application of Surgery to the Hypoglycemic State Due to Islet Tumors of the Pancreas and to Other Conditions, Surg., Gynec. & Obst. **56**: 728-742 (April) 1933.
5. McCaughan, J. M.: Subtotal Pancreatectomy for Hyperinsulinism; Operative Technic, Ann. Surg. **101**: 1336-1341 (June) 1935.
6. Judd, E. S., and Parker, B. R.: Biliary Intestinal Anastomosis for Obstructive Jaundice; Analysis of 137 Consecutive Cases, Arch. Surg. **17**: 1-17 (July) 1928.
7. Walters, Waltman: Successful Resection of the Ampulla of Vater, Including a Portion of the Duodenum with Choledochoduodenostomy, for Carcinoma of the Ampulla of Vater, Surg., Gynec. & Obst. **55**: 648-651 (Nov.) 1932.
8. Potter, E. B.: Successful Resection of the Common Biliary Duct for Carcinoma of the Ampulla of Vater, Ann. Surg. **98**: 369-373 (Sept.) 1933.
9. Hunt, V. C., and Budd, J. W.: Transduodenal Resection of the Ampulla of Vater for Carcinoma of the Distal End of the Common Duct, Surg., Gynec. & Obst. **61**: 651-661 (Nov.) 1935.
10. (*a*) Finney, J. M. T.: Resection of the Pancreas, Ann. Surg. **51**: 818-829, 1910. (*b*) Finney, J. M. T., and Finney, J. M. T., Jr.: Resection of the Pancreas, Ann. Surg. **88**: 584-592 (Sept.) 1928. (*c*) Gordon-Taylor, G.: The Radical Surgery of Cancer of the Pancreas, Ann. Surg. **100**: 206-214 (July) 1934.
11. Bigelow, G. H., and Lombard, H. L.: Cancer and Other Chronic Diseases in Massachusetts, Boston, Houghton Mifflin Company, 1933, p. 264.
12. Marble, A.: Diabetes and Cancer, New England J. Med. **211**: 339-349 (Aug. 23) 1934.
13. Hoffman, F. L.: San Francisco Cancer Survey, Seventh Preliminary Report, Newark, N. J., Prudential Press, 1931, p. 218.
14. Leven, N. L.: Primary Carcinoma of the Pancreas, Am. J. Cancer **18**: 852-874 (Aug.) 1933.

Direct extension of the malignant process into contiguous viscera occurs in the later stages of the disease, and metastases have been noted in the duodenum, the stomach, the colon, the kidneys and ureters, the spleen, the adrenals and the general peritoneal cavity.

It is probable that most cancers of the pancreas first metastasize into the regional lymph nodes. As may be seen from the artist's drawing, innumerable lymph nodes lie in close proximity to the head of the gland and beneath the body and tail (figs. 1 and 2). These are early and often involved in the malignant process.

Secondary growths are most frequently found in the liver, and it is probable that these arise as a result of invasion of the veins, emptying into the portal system. Metastases to the lungs and pleura have been frequently reported. Generalized metastases in pancreatic malignancy are rare.

PATHOLOGIC PHYSIOLOGY

As a tumor in the pancreas grows it may produce changes in physiologic function by obstructing the common bile duct, by obstructing the pancreatic ducts, by influencing the activity of the islands of Langerhans, or by invading the adjacent viscera. Obstructive jaundice and interference with liver function are very common in cancer of the pancreas. This would be expected, since 87 per cent of the tumors sooner or later involve the head of the gland and so can encroach on the common bile duct. Difficulties from a loss of pancreatic secretion are not common, owing, no doubt, to the ability of intestinal secretions to manage, in its absence, a large part of the digestive functions of the pancreatic secretion. Hyperinsulinism from excess production of insulin by a tumor of an island of Langerhans is rare. Duodenal obstruction and gastro-intestinal bleeding from invasion of the gastro-intestinal canal by pancreatic cancers is a frequent late occurrence in the course of malignant growths of the pancreas. Diabetes mellitus is rare, since the islands of Langerhans often persist in spite of extensive pancreatic cancer.[15] Eusterman[16] found that glycosuria was conspicuous by its infrequence. Friedenwald[17] found only one case of permanent glycosuria and five of transient glycosuria in thirty-seven cases. Hick and Mortimer,[18] however, noted that eight of their fifty cases presented diabetes.

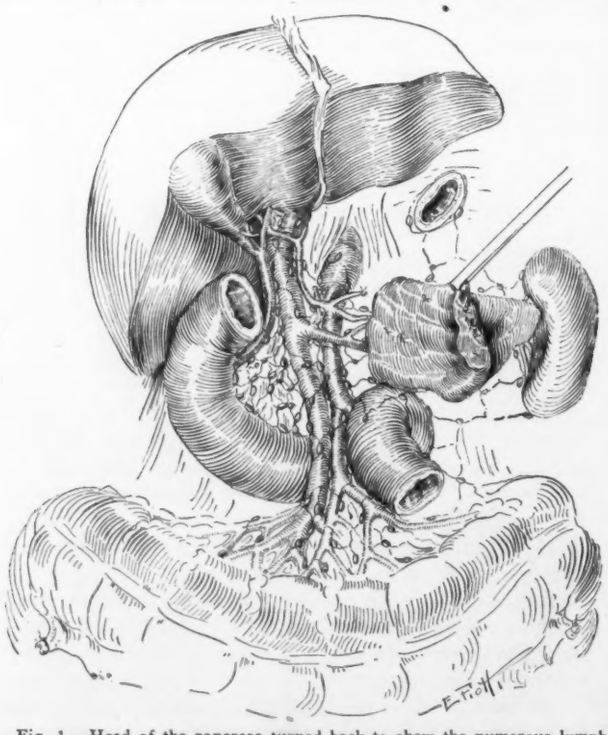

Fig. 1.—Head of the pancreas turned back to show the numerous lymph nodes to which metastases may spread. The relations of the superior mesenteric vessels, portal vein and common bile duct to the pancreas and duodenum are clearly revealed.

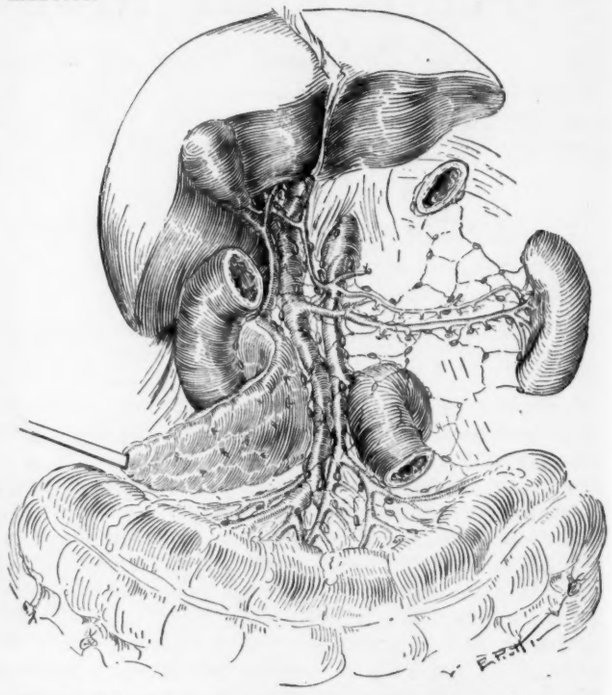

Fig. 2.—Tail of pancreas turned back. Note the pancreatic branches from the splenic artery and vein that have been ligated. The numerous lymphatic glands behind the pancreas are seen.

SYMPTOMS

Progress in the treatment of pancreatic cancer is largely dependent on the early diagnosis of this lesion before it has become extensive in its growth and before metastases have occurred. It is highly important, then, that the earliest symptoms which may point to pancreatic malignancy shall be listed and reviewed so that the goal of early diagnosis may be more frequently reached.

It is doubtless true that the first step in the early diagnosis of cancer of the pancreas is the recognition by physicians of the significance of rather vague digestive symptoms in male patients in middle life. It is probably true that sufficient data could readily be obtained in many of these cases which would at least justify a surgical exploration if the possibility of cancer of the pancreas was more often considered and investigated.

All physicians are familiar with those cases of cancer of the pancreas which show as their typical symptoms painless jaundice, distended gallbladder, cachexia and weight loss, as first described by Bard and Pic.[19] One will rarely see a patient presenting these appearances, however, in whom there is not a history of several

15. Warren, Shields: The Pathology of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1930, pp. 65-70.
16. Eusterman, C. B., and Wilbur, D. L.: Primary Malignant Neoplasm of the Pancreas: A Clinical Study of Eighty-Eight Verified Cases Without Jaundice, South. M. J. **26**: 875-883 (Oct.) 1933.
17. Friedenwald, J., and Cullen, T. S.: Carcinoma of the Pancreas: Clinical Observations, Am. J. M. Sc. **176**: 31-41 (July) 1928.
18. Hick, F. K., and Mortimer, H. M.: Carcinoma of the Pancreas, J. Lab. & Clin. Med. **19**: 1058-1067 (July) 1934.
19. Bard, L., and Pic, A.: Contribution à l'étude clinique et anatomo-pathologique du cancer primitif du pancréas, Rev. de méd. **8**: 257-282, 363-405, 1888.

weeks of epigastric discomfort and distress, indigestion, flatulence and often pain preceding the jaundice. Twice I have had jaundice develop in patients while under hospital observation for ill defined digestive disturbances. In each instance cancer of the pancreas with a widely dilated common duct was found at operation a few days after the onset of the jaundice. It would appear that the typical picture described by Bard and Pic [19] is the picture of late pancreatic cancer which has progressed sufficiently to obstruct the common bile duct.

The early symptoms suggestive of cancer in the pancreas are not distinctive and for this very reason the diagnosis of pancreatic cancer should be considered when careful examination fails to reveal a definite lesion in the stomach, duodenum, colon or gallbladder to account for the patient's new digestive trouble.

Most writers [20] agree that epigastric pain is the commonest early symptom of pancreatic cancer. This is usually dull, boring and penetrating in character. Occasionally the pain is colic-like and when this occurs may well be due to the association of gallbladder stones with the pancreatic cancer. Accompanying the pain very often are digestive distress and epigastric fulness, and in many instances abdominal distention.

A very large and usually a very rapid weight loss is the second most common early symptom of this disease. In many cases the loss of weight is more than 50 pounds (23 Kg.) and it generally occurs in a very short time. Such large and rapid weight loss in a man at middle life should always be highly suggestive of pancreatic cancer, particularly if no other adequate cause can be found to account for it.

The length of time from the first evidences of pancreatic cancer to the appearance of jaundice varies, of course, with the location of the tumor in the pancreas and its relation to the common duct. Occasionally the first symptom that can be elicited from the patient is the appearance of jaundice. This is unusual and in many cases weeks or months of digestive trouble go by before jaundice is noted. The longer this interval, the more probable it is that the tumor did not arise in the head of the gland. In at least 10 per cent of cases no jaundice ever appears in the course of the disease.

When the tumor arises in the body or tail of the pancreas, jaundice either is long delayed or is never encountered. Here attacks of severe pain due to the pressure of the tumor on the vessels and nerves behind the pancreas are at times encountered. Chauffard [21] refers to a "syndrome pancreatico-solaire" seen in these cases, to be distinguished from the "syndrome pancreatico-biliaire" of Bard and Pic,[19] which is present when the tumor lies in the head of the pancreas. The pain in cancer of the body or tail of the pancreas is usually referred to the back on either side and across the epigastrium. It is occasionally relieved if the patient leans forward and so removes the pressure of the tumor from the retroperitoneal structures.

PHYSICAL SIGNS

In many instances the very absence of physical signs on examination must be, in itself, suggestive of pancreatic cancer. In the advanced case, however, of cancer in the head of the gland, the jaundice is persistent with no remissions. The gallbladder is dilated and can be felt in more than half of the cases. A sausage shaped epigastric tumor may at times be palpated when the lesion involves the body or tail of the gland. Eusterman [16] recommends the intravenous administration of from 3 to 5 grains (0.2 to 0.3 Gm.) of sodium amytal in patients suspected of pancreatic cancer. With the muscular relaxation thus obtained, a tumor may at times be palpated in the body or tail of the gland.

In every patient thorough gastro-intestinal x-ray study should be done to rule out lesions in the stomach, duodenum, gallbladder or colon. By these x-ray studies a wide sweep of the duodenum around the head of the pancreas may be noted, or the greater curvature of the stomach may be encroached on by an obviously extragastric lesion. Engel and Lysholm [22] have attempted to obtain special films of the pancreatic area by first giving the patient an effervescing powder to fill his stomach with gas. They then take lateral and anteroposterior plates and believe they can outline pancreatic tumors in certain cases. Further progress in x-ray technic will no doubt be made to aid in earlier diagnosis of these cases.

Fig. 3.—Starting the surgical approach to the pancreas by dividing the gastrocolic omentum. Great care must be taken to avoid injury to the middle colic artery.

Duodenal tube drainage of the region of the ampulla will very often show an absence of bile and may show blood. Such changes are very suggestive of pancreatic cancer. If the tumor of the pancreas is in the body or tail, however, the duodenal tube may reveal little or nothing of diagnostic help. Blood may be persistently present in the stools in those cases in which the tumor has invaded the duodenum or stomach.

In a few cases traces of sugar will be found in the urine, but true diabetes in cancer of the pancreas is not as common as has been thought.

Tests of urine, stools and blood for evidences of faulty pancreatic function have not as yet proved of practical value in diagnosing pancreatic cancer, no doubt because of the ability of relatively small portions of the gland to carry on its functions.

20. Hick and Mortimer.[18] Eusterman and Wilbur.[16] Friedenwald.[17] Graves, M. L.: Diagnostic Criteria of Malignant Disease in the Upper Right Quadrant, J. A. M. A. **87:** 842-846 (Sept. 11) 1926. Fried, B. M.: Some Clinical Aspects of Primary Carcinoma of the Pancreas, Boston M. & S. J. **196:** 640-644 (April 21) 1927.

21. Chauffard, A.: Le cancer du corps du pancréas, Bull. l'Acad. de méd. **60:** 242-255, 1908.

22. Engel, A., and Lysholm, E.: Contribution à l'étude de la symptomatologie du cancer pancréatique, Acta med. Scandinav. **80:** 34-42, 1933.

DIAGNOSIS

The diagnosis of the well advanced case of pancreatic cancer with weight loss, pain, progressive jaundice and a palpable mass in the right upper portion of the abdomen is readily made. Stones in the common duct, however, may give these identical symptoms and in certain cases cannot by any present methods be certainly differentiated from cancer of the pancreas. This fact cannot be overemphasized, since it is such a basic reason for urging the surgical exploration of patients who appear to have hopeless pancreatic cancer.

The diagnosis of early cases of pancreatic cancer, however, is dependent, first, on the clinician's recognizing the possibilities of the lesion and consciously attempting to prove or disprove its presence. I am convinced that measures to attack pancreatic cancer will be limited until either we think of its possibility more frequently or develop new diagnostic measures for its earlier detection.

The occurrence in a man at middle life of digestive disturbances, epigastric fulness and discomfort, pain and weight loss warrant a thorough study by all the means available. If no positive diagnosis is revealed

Fig. 4.—Approach to the pancreas may be made by dividing the gastrohepatic omentum and displacing the stomach drownward. Exposure of the tail of the gland is less complete by this method.

by examination and gastro-intestinal studies, the possibility of pancreatic cancer must be considered at once. Auscultation of the abdomen, palpation for a deep tumor, under anesthesia if need be, and repeated studies for the possibility of an increase in the bilirubin of the blood may reveal sufficient further evidence to warrant exploration of the upper part of the abdomen. In many instances all available data will be too indecisive to permit a positive diagnosis but will nevertheless be sufficiently suggestive to warrant exploration of the abdomen.

TREATMENT

In cancer of the pancreas, in common with cancer elsewhere in the body, there are three possible measures for treatment, which may be used singly or in combination. These are high voltage roentgen therapy, radium treatment and surgical excision.

High voltage roentgen therapy for cancer of the pancreas has received but little attention from the profession, and the literature contains few references to its use in this condition. Dr. G. E. Richards [23] of Toronto treated three cases in 1920 and published his results in 1922. Two of his three patients showed marked improvement for a time, but all three eventually died. Dr. Richards has not continued the use of high voltage roentgen therapy in cancer of the pancreas. Dr. H. Flecker and Dr. Gordon Cameron [24] in Australia noted his work, however, and in 1925 reported several cases of pancreatic cancer treated in the course of some experimental work on the blood sugar after high voltage roentgen therapy of the pancreas. They reported marked improvement in some of their cases for a time, but their paper lacks detailed case reports. Von Redwitz [25] found no value in high voltage roentgen therapy for cancer of the pancreas. Leven [26] reported in 1933 the treatment of four cases by high voltage roentgen therapy. Each of his patients had had a cholecystenterostomy. All four died within a short time and no improvement was noted from roentgen threapy.

Fisher, Groot and Bachem [27] and also Ivy, McCarthy and Orndoff [28] have produced fibrosis, atrophy and even diabetes experimentally by intensive roentgen therapy over the pancreas. All reported the marked ability of the pancreas to regenerate following this treatment.

During my service in the Lahey Clinic I had the opportunity of following five patients with apparent cancer of the pancreas who were given roentgen therapy at my suggestion. Three of these cases seemed to show some improvement following this therapy, and two were apparently not affected by it. Since equal improvement has been seen in other patients who had not had roentgen therapy, it is not possible to draw any deduction from this experience. Certainly high voltage roentgen therapy would appear to be the least valuable type of therapy available in cancer of the pancreas. On the other hand, further refinement in apparatus and technic may render it far more useful, and x-rays should not be lost sight of as a possible therapeutic agent in malignant conditions of the pancreas.

Very little clinical work has been reported on the use of radium in malignant disease of the pancreas, yet it would seem that this might be a logical approach to the treatment of this lesion. Handley [29] of London has treated seven cases of pancreatic cancer, all in the head of the gland, with radium element. All seven patients had biliary intestinal anastomoses made at the time of the radium application, and four patients died postoperatively. One, however, lived fourteen years, one twenty-six months, and one was still alive ten months after the operation. Handley reports no biopsies in these cases, however, so that the certainty of the diagnosis is rather unsettled. Most important, however, is the fact that Handley demonstrates that radium may be safely applied to cancer of the pancreas in human patients.

From the experimental point of view, Leven [26b] found that radon in gold seeds would produce a marked fibrosis and atrophy of the pancreas in dogs. He found that the gland regenerated rapidly after irradiation, and he believes that radon may be safely implanted in the

23. Richards, G. E.: Possibilities of Roentgen Ray in Cancer of the Pancreas, Am. J. Roentgenol. **9**: 150-152 (March) 1922.

24. Flecker, H., and Cameron, Gordon: A Note on Alteration in Blood Sugar Values After Intensive Deep Roentgen Irradiation, M. J. Australia **1**: 478-480 (May 9) 1925.

25. von Redwitz, E.: Die Chirurgie der Bauchspeicheldrüse, München. med. Wchnschr. **71**: 1561-1567 (Nov. 7) 1924.

26. Leven, N. L.: (*a*) footnote 14; (*b*) An Experimental Study: The Effect of Radium Emanation on the Pancreas of Dogs, Am. J. Cancer **18**: 899-904 (Aug.) 1933.

27. Fisher, N. F.; Groot, J. T., and Bachem, A.: The Effects of X-Ray on the Pancreas, Am. J. Physiol. **76**: 299-305 (April) 1926.

28. Ivy, A. C.; McCarthy, J. E., and Orndoff, B. H.: Studies on the Effect of Roentgen Rays on Glandular Activity, J. A. M. A. **83**: 1977-1984 (Dec. 20) 1924.

29. Handley, W. S.: Pancreatic Cancer and Its Treatment by Implanted Radium, Ann. Surg. **100**: 215-223 (July) 1934.

human pancreas. In a later paper he states that he placed gold implants of radon in the substance of a small tumor in the head of the pancreas. The patient died of hemorrhage into the gastro-intestinal tract.

Very possibly a two-stage operation, in which a biliary intestinal anastomosis was done at the first stage and radium implanted at the second, would be desirable. Only a short interval of two or three weeks should intervene between stages. With this procedure, the jaundice could be overcome by the first operation and definite plans made for the amount of radium to be used at the second operation, in view of the location and size of the tumor. It would appear that the problem of radiation therapy in cancer of the pancreas should receive further study.

SURGICAL TREATMENT

It is now becoming more generally accepted that the seriously jaundiced patient who apparently has cancer of the pancreas should have a surgical exploration for two purposes: (1) to make as certain as possible that the jaundice is due to cancer of the pancreas and not to common duct stones or pancreatitis, and (2) to consider anastomosis of the gallbladder or common duct to the stomach or intestine for the purpose of relieving the jaundice.

It must be recognized however, that simple exploration in cancer of the pancreas carries a definite mortality with it and that the average length of life after exploration is less than with no operative procedure. In my experience the average length of life in cancer of the pancreas unoperated on is 7.2 months after the first diagnosis is made, and after simple exploration it is but three months. Exploration, therefore, is not advisable in the far advanced cases and should not be done unless one has a reasonable certainty that at least a biliary intestinal anastomosis can safely be made.

Biliary intestinal anastomoses also carry a heavy immediate mortality, which varies in different clinics, doubtless because of a difference in the selection of cases. These patients, furthermore, are prone to develop later difficulties from infection of the biliary tract from the anastomosis. These factors, however, should not condemn the procedure. The postoperative improvement which these jaundiced patients obtain from a successful short circuiting operation is often remarkable, and the majority are at least temporarily relieved of their jaundice. There are occasional cases in every one's experience of patients who live several years after this procedure. The average duration of life after this operation is but seven months, however, even when the unusually long survivors are included.[30]

In all these operative procedures for pancreatic cancer it is evident that the surgery is undertaken only at the terminal stage of the disease and is complicated by the presence of obstructive jaundice, which is usually of long duration. Can we not hope to develop diagnostic methods and clinical acumen sufficiently keen to permit us to approach malignant lesions of the pancreas at earlier stages, and with the plan of undertaking radical removal of the malignant process?

The literature of cancer of the pancreas is filled with statements to the effect that, because of its deep situation and the difficult approach, radical removal of the pancreas is either impossible or at least most unwise. Most studies of pancreatic malignancy have come from medical men and pathologists. Surgeons until recently have but rarely discussed radical pancreatic operations save in the light of palliative measures for the relief of jaundice.

Finney [10a] in 1910 successfully removed a tumor of the body of the pancreas and found reports of sixteen other cases of removal of pancreatic cancers in the literature, with a 50 per cent mortality. In 1928 [10b] he reported the successful resection of part of the pancreas for hypoglycemia. At this time he stated his belief that in the eighteen years since his previous report radical surgery of the pancreas had advanced but little.

In 1907 Desjardins [31] and in 1908 Sauvé [32] suggested very radical procedures for the removal of malignant tumors of the head of the pancreas. These operations included a biliary intestinal anastomosis, a resection of the head of the pancreas and the duodenum, a reuniting of intestinal continuity, and finally the insertion of the pancreas or its duct into the intestine. The division of these steps into two operations was proposed. These procedures were attempted only a few

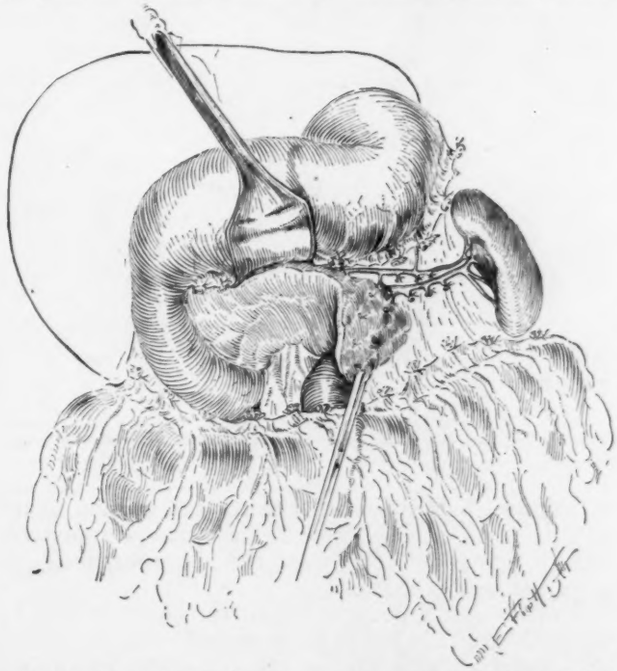

Fig. 5.—The parietal peritoneum over the pancreas has been divided and the tail lifted with a double hook. Each branch of the splenic artery and vein is dissected and divided as the removal of the tissue continues.

times and were generally considered as far too radical to be undertaken by conscientious surgeons.

Recent reports of successful resections of the head of the pancreas have been made by Whipple, Parsons and Mullins,[3] who followed these fundamental procedures proposed by Desjardins and Sauvé with one notable change. They ligated the pancreatic ducts and made no attempt to provide for the escape of the external secretion of the pancreas. MacCallum [33] had done this with animals in 1909 in the laboratory and found that this resulted in some atrophy of the pancreas but was by no means incompatible with life. By this procedure the formidable procedures of Desjardins and Sauvé were made more practical and were more readily applied. It would appear that the way is now clearly opened by this work of Whipple for wider study of the problem of resection of the head of the pancreas.

30. Judd and Parker.[9] Coller, F. A., and Winfield, J. M.: Evaluation of Palliative Operation for Cancer of the Pancreas, Am. J. Surg. **25**: 64-69 (July) 1934.

31. Desjardins, A.: Technique de la pancréatectomie, Rev. de chir. **35**: 945-973, 1907.

32. Sauvé, L.: Des pancréatectomies et spécialement de la pancréatectomie céphalique, Rev. de chir. **37**: 335-385, 1908.

33. MacCallum, W. G.: On the Relation of the Islands of Langerhans to Glycosuria, Johns Hopkins Hosp. Bull. **20**: 265-268, 1909.

Less complicated problems are involved in resections of the body or tail of the pancreas for cancer, since jaundice is absent and since neither biliary nor gastrointestinal anastomoses are necessary.

The incision in the abdominal wall to approach the body or tail of the pancreas has commonly been a longitudinal one in the left rectus (fig. 3). This may

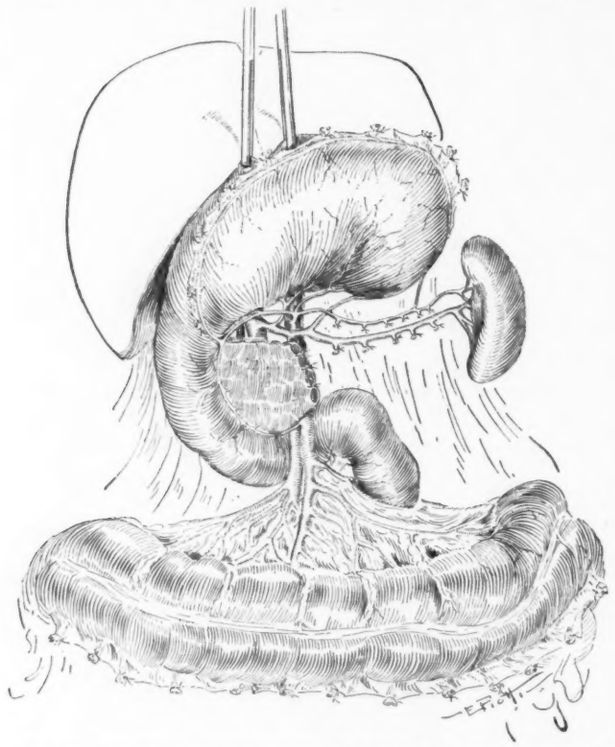

Fig. 6.—The dissection has been carried over to the superior mesenteric vessels. The cut end of the pancreas has been folded over with catgut sutures.

be enlarged by an additional transverse incision to the left, if need be. Whipple [34] finds that a transverse incision across both rectus muscles above the umbilicus gives the best exposure.

Tumors of the body or tail of the pancreas may be exposed surgically through the gastrohepatic omentum, the gastrocolic omentum or the transverse mesocolon. The latter route is probably of little value, and its practical use I have not found recorded in the literature. Finney,[10] Judd [6] and Gordon-Taylor [10] all approached the pancreas through the gastrohepatic omentum (fig. 4). Judd remarks that exposure may be increased if need be by going through the gastrocolic omentum. Most recent radical surgery on the pancreas, however, has been through the gastrocolic omentum. Thus Roscoe Graham,[1] Evarts Graham,[4] Holman,[35] Cottalorda,[36] McCaughan [5] and Whipple [34] have all found this the most satisfactory route for exposing the gland.

The vessels in the gastrocolic omentum are divided along the greater curvature of the stomach (fig. 3). Care is taken to avoid injury to the middle colic artery, which should be well out of the way unless adhesions in the lesser peritoneal sac obscure it. With properly placed packs of wet gauze, the stomach is now retracted upward and the colon downward, and the entire body and tail of the pancreas are brought into view. McCaughan [5] recommends elevation of the patient's back by a suitable back rest to bring the pancreas into better position. This would seem a point of definite advantage, especially in stout patients.

With adequate exposure the removal of the tumor of the pancreas may now be undertaken. Dissection is best started at the tail of the pancreas by incision of the peritoneal layer overlying the gland, starting gently to elevate it from its bed (fig. 5). The splenic artery and vein lie in close relation to the pancreas and form the chief complication to its easy dissection. Holman [35] believed he would ligate them and do a splenectomy if any difficulty was encountered in dissecting them. McCaughan [5] retracts the vessels early in the dissection and lifts them with a tape to facilitate the catching of their numerous pancreatic branches. Gordon-Taylor,[10] however, states that in removing a large tumor of the body of the pancreas he ligated the splenic artery and vein and noted no difficulty after operation that was related to interference with the blood supply of the spleen. This procedure would appear to be unwise for routine use.

As the dissection is continued from left to right, the superior mesenteric vessels are soon encountered (figs. 1 and 2). Here great care, precision and gentleness must prevail in order that they may be left intact. Gordon-Taylor [10] found the tumor in his case so adherent to the portal vein that he removed part of its wall and closed it by suture over an intestinal clamp that he placed longitudinally on it.

Control of bleeding must be largely by hemostat and ligature, though veins may well be closed with a running suture (fig. 6). Division of the body of the pancreas itself is best done by making a wedge-shaped excision,

Fig. 7.—The incision in the gastrocolic omentum has been closed about a cigaret drain that leads to the cut end of the pancreas.

which can then be closed by interrupted or continuous sutures. McCaughan [5] has found it desirable to place a rubber covered right angle clamp on the gland before cutting it off in order to control the bleeding. Von Haberer employs the electric cautery in excising portions of the pancreas.

34. Whipple, A. O., and Frantz, v. K.: Adenoma of the Islet Cells with Hyperinsulinism: A Review, Ann. Surg. **101:** 1299-1335 (June) 1935.

35. Holman, Emile, and Railsback, O. C.: Partial Pancreatectomy in Chronic Spontaneous Hypoglycemia, Surg., Gynec. & Obst. **56:** 591-600 (March) 1933.

36. Cottalorda and Escarras: Epithelioma langheransien: Extirpation, guérison, Lyon chir. **30:** 248-253 (March-April) 1933.

An escape of pancreatic fluid is so prone to occur after pancreatectomy that all writers agree that a drain should be left in place down to the cut surface of the organ (fig. 7). Drainage of pancreatic secretion may continue from a few days to several months and will occasionally require much attention to prevent digestion of the wound surfaces.

Surprisingly few reports are to be found in the literature of successful removal of malignant tumors of the body or tail of the pancreas in the hundred years since Mondière [37] first described cancer of the pancreas. Recent interest in the surgical treatment of pancreatic tumors has been so stimulated by the results obtained by resection of the pancreas or of islet tumors for hyperinsulinism that we may surely anticipate an increase in the number of pancreatic cancers attacked surgically. Wider study of the early symptoms of pancreatic cancer will give increasing opportunity for the application of surgical and radiologic measures to the pancreas. The pancreas is no longer in the realm of the surgically "untouchables" and can readily be approached by surgeons well trained in the management of serious abdominal diseases.

171 Bay State Road.

37. Mondière, J.-T.: Récherches pour servir à l'histoire pathologique du pancréas, Arch. gén. de méd., 2d series **11**: 36-58, 265-294, **12**: 133-163, 1836.

CORONARY ARTERY DISEASE IN WOMEN

HYMAN LEVY, M.D.
AND
ERNST P. BOAS, M.D.
NEW YORK

In women, especially those under the age of 50, coronary artery disease is unusual in the absence of diabetes or hypertension. Yet precordial pain simulating angina pectoris is a very common symptom. Although experienced clinicians have been aware of this fact for years, it is overlooked again and again in daily practice and many mistaken diagnoses result.

During the past seven years in an office practice representing largely patients referred for cardiovascular diagnosis, we have seen 1,672 women, of whom 169, or 10.1 per cent, had coronary artery disease. In the same period we saw 2,135 men, of whom 1,059, or 49.6 per cent, had coronary artery disease. The frequency is 4.9 times as great in men as in women. Of the 169 cases in women, 125, or 74 per cent, were associated with hypertension alone, twenty-five, or 14.8 per cent, with both diabetes and hypertension, and six, or 3.5 per cent, with diabetes alone. In only thirteen cases, or 7.7 per cent, was there neither hypertension nor diabetes, and of these only five were in women under the age of 50. In many of the cases in the last group the diagnosis of coronary artery disease is open to some doubt. Fully 50 per cent of the male patients with coronary artery disease had neither hypertension nor diabetes. Approximately one third of all the female patients with hypertension seen by us have coronary artery disease.

Heberden [1] observed only three women in his series of 100 patients with angina pectoris; Forbes [2] saw eight in eighty-eight, Osler [3] one in forty, and Burwinkle [4] seventeen in 117. More recent statistics also show a great preponderance of coronary disease in men. White [5] found the ratio of incidence in men as compared to women to be 3 to 1. Gallavardin [6] found a ratio of 4.7 to 1. In 1,431 consecutive necropsies showing coronary sclerosis studied by Willius, Smith and Sprague,[7] men outnumbered women 3.2 to 1. Other observers have reported approximately the same figures.[8]

The validity of all such statistics depends on the criteria employed for the diagnosis of coronary artery disease, and in this respect some of the older literature in particular is open to question. We employed strict criteria for the diagnosis of coronary artery disease. The diagnosis of angina pectoris was made only if the history revealed a typical Heberden's syndrome; that is, substernal or left parasternal pressure or pain provoked by effort or excitement, compelling the patient to halt his activities. In many instances there was typical radiation to the left arm and aggravation of symptoms on exertion after meals or in cold or windy weather. Coronary sclerosis with myocardial fibrosis was diagnosed when, in addition to the classic history, there were electrocardiographic changes indicative of myocardial injury, such as deformation of the RT segment or the T wave or marked alteration of the QRS complex. Coronary thrombosis was diagnosed when there was a history of an attack of severe substernal pain, lasting one or more hours, accompanied by symptoms of shock, often with subsequent cardiac insufficiency, compelling rest in bed for a period of weeks following the attack. We excluded all cases of syphilitic aortitis, as well as all cases of aortic insufficiency of whatever origin.

The favoring influence of hypertension on the development of coronary artery disease in women has been noted by several authors. White [5] remarks that "many of the women with angina pectoris have hypertension, which may be of enough importance in increasing cardiovascular strain to be in part responsible." Eppinger and Levine [9] write: "One should therefore hesitate to make the diagnosis of angina pectoris unassociated with coronary thrombosis for any woman with a low blood pressure, especially for those under 50 years of age." Mackenzie [10] writes: "When therefore we find a woman under 50 with no gross disease of the heart or when we can exclude arterial degeneration, we may fairly assume that the anginal attacks are secondary, especially in women before and about the menopause." In Gallavardin's [6] series only five of

1. Heberden, William: Commentaries on the History and Cure of Diseases, London, T. Payne, 1802, p. 366.

2. Forbes, J.: The Cyclopaedia of Practical Medicine, London, Sherwood, Gilbert and Piper, Baldwin and Cradock, 1833, vol. 1, p. 83.

3. Osler, William: Angina Pectoris and Allied States, New York, D. Appleton & Co., 1897, p. 22.

4. Burwinkle, O.: Angina Pectoris, Deutsche med. Wchnschr. **32**: 567, 1906.

5. White, P. D.: Heart Diseases, New York, Macmillan Company, 1931, p. 609.

6. Gallavardin, L.: Les angine de poitrine, Paris, Masson & Cie, 1925, p. 35.

7. Willius, F. A.; Smith, H. L., and Sprague, P. H.: A Study of Coronary and Aortic Sclerosis: Incidence and Degree in 5,060 Consecutive Postmortem Examinations, Proc. Staff Meet., Mayo Clin. **8**: 140 (March 1) 1933.

8. Bell, E. T., and Clawson, B. J.: Primary (Essential) Hypertension, Arch. Path. **5**: 939 (June) 1928. Gager, L. T., and Dunn, W. L.: Heart Disease in Washington, D. C., Study of Etiologic Types and Factors of Race, Age, and Sex in 1,200 Cases, M. Ann. District of Columbia **2**: 112 (May) 1933. Levine, S. A.: Coronary Thrombosis: Various Clinical Features, Medicine **8**: 245 (Sept.) 1929. Mullins, W. L.: Age Incidence and Mortality in Coronary Occlusion: A Review of 400 Cases, Pennsylvania M. J. **39**: 322 (Feb.) 1936.

9. Eppinger, E. C. and Levine, S. A.: Angina Pectoris, Arch. Int. Med. **53**: 120 (Jan.) 1934.

10. Mackenzie, James: Angina Pectoris (Oxford Medical Publications) London, Henry Frowde, Hodder and Stoughton, 1923, p. 127.

sixty-six women with coronary artery disease had normal blood pressures and hearts that were not enlarged.

Nor has the fact escaped attention that the presence of diabetes mellitus increases the incidence of coronary artery disease in women. Root and Graybiel [11] showed that the frequency of coronary artery disease in diabetic patients is almost the same in the two sexes. Contrasting this observation with the usual great excess of coronary artery disease among males, they conclude that the diabetes is the cause of this "leveling influence." On the basis of necropsy studies, Nathanson [12] reaches a similar conclusion. He finds that in diabetes the tendency to coronary arterial changes is almost as great in the female as in the male. This is true not only of the coronary arteries but even more so for the peripheral arteries. Cases of coronary thrombosis have been described in female diabetic patients under the age of 35.[13]

Ordinarily the diagnosis of coronary artery disease is simple, particularly when there are objective physical or electrocardiographic signs of heart disease. In many cases, however, objective evidences are absent and the diagnosis must be made on the history alone. This too offers few difficulties in men, because the story of clamping substernal pain on exertion or excitement, compelling the patient to arrest his activities, is so clear cut. At times relief of the seizure by glyceryl trinitrate further confirms the diagnosis. When the histories are colored with secondary, usually functional, symptoms the picture is more obscure; the primary symptoms stand out less clearly, and diagnosis may be difficult. This obtains particularly among women patients, in whom even in the presence of coronary artery disease the syndrome is often marked by vasomotor symptoms. The diagnosis of coronary artery disease often depends primarily on the evaluation of symptoms, and this at times is very difficult in women. Mistaken diagnoses of angina pectoris in women are due to a misinterpretation of symptoms and to ignorance of the rarity of coronary artery disease in women who have neither hypertension nor diabetes.

There is no need to elaborate the clinical picture of true coronary artery disease as it occurs in women, for it does not differ from the generally recognized form. It is the cases that simulate coronary artery disease which require more detailed discussion. This is most graphically done in the light of some illustrative cases:

REPORT OF CASES

M. S., a woman, aged 47, had had a cholecystectomy for gallstones without relief of the symptoms. In October 1925, when she was 37, she was greatly disturbed by some happening and a few hours later a squeezing choking pain developed high in the epigastrium, which radiated up the sternum and down the left arm. The late Dr. M. H. Kahn saw her at this time. Her face and hands were white. The blood pressure was 136 systolic, 94 diastolic. She was kept in bed for three weeks and had repeated mild pains in the upper part of the chest during this period. The electrocardiogram was negative. On admission to Mount Sinai Hospital in 1927 she complained of severe epigastric pain coming fifteen minutes after meals, radiating to the left and lasting from two to five hours. For half a year she had been having attacks of severe precordial pain radiating to the left arm and right shoulder. The pain was constant, and about twice a week she had attacks during which it became more severe, especially on exertion. Physical examination was negative, the blood pressure was 130 systolic, 90 diastolic, and the electrocardiogram was negative. Roentgenography revealed some enlargement of the left ventricle. Roentgen study of the gastro-intestinal tract was negative.

We first saw her in 1932, when she complained that for a few weeks she had had episodes of sharp sticking pain to the left of the sternum, which radiated to the left shoulder and arm, brought on by exertion and excitement and accompanied by weakness and nausea. Physical examination and electrocardiography again were negative; fluoroscopy revealed moderate left ventricular enlargement; the blood pressure was 118 systolic, 80 diastolic. A year later she reported that she had been well for six months but that then the precordial pain had returned on walking; her chief complaint, however, was epigastric and right hypochondriac pain. Again there was no change in the physical and electrocardiographic manifestations.

She was last seen in February 1936, more than ten years after the onset of the illness. She has much the same symptoms. While doing her housework she becomes dizzy and weak and experiences choking cramps over the entire chest. At times she can walk freely, and at times she is compelled to rest after walking a block because of pressure in the lower part of the sternum. Frequently her body shakes and she has palpitation. She is nervous and feels as though "a machine were working in her body." Again physical examination is negative and the electrocardiogram unchanged.

The major attack at the age of 37, together with the present history, suggests coronary artery sclerosis and that she probably experienced a coronary thrombosis at the onset. However, the early age at onset, the persistence of severe symptoms for ten years without the development of any objective signs, and the varied

Analysis of 169 Cases of Coronary Artery Disease in Women

	Cases		Under 50 Yrs. of Age			Average Age at Onset of Angina in Years	Average Weight		Average Blood Pressure		Diagnosis *				
	No.	Per Cent	No.	Percentage	Per Cent of Total Cases		No. Cases		Systolic	Diastolic	Angina Pectoris	Coronary Sclerosis	Coronary Thrombosis	Known Deaths	Deaths Directly Attributable to Coronary Artery Disease
In presence of hypertension alone	125	74.0	39	31.2	23.1	53.2	160	65	182	103	47	56	22	10	7
In presence of diabetes alone	6	3.5	4	66.7	2.4	47.5	159	4	132	84	3	2	1	1	..
In presence of both hypertension and diabetes	25	14.8	7	28.0	4.1	53.6	150	12	179	97	6	13	6	2	2
In absence of both hypertension and diabetes {Unquestioned cases	9	5.3	2	22.2	1.2	53.8	153	8	132	84	3	2	4	1	1
In absence of both hypertension and diabetes {Questionable cases	4	2.4	3	75.0	1.7	43.3	170	3	131	91	3	..	1	..	..
Totals	169	100	55		32.5						62	73	34	14	10

* See text for criteria for classification.

11. Root, H. F., and Graybiel, Ashton: Angina Pectoris and Diabetes Mellitus, J. A. M. A. **96**: 925 (March 21) 1931.
12. Nathanson, M. H.: Coronary Disease in 100 Autopsied Diabetics, Am. J. M. Sc. **183**: 495 (April) 1932.
13. Warren, Shields: Pathology of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1930.

abdominal symptoms, as well as the shaking and palpitation, point rather to a functional derangement, a conversion neurosis.

S. C., a woman, aged 33, when seen in May 1931, had been having attacks of sticking precordial pain radiating to the left arm for one year, which occurred both at rest and on excitement. Two days after the sudden death of a friend from heart disease she had an attack of severe pain in the back of the left shoulder, radiating down the left arm, and a choking sensation in the neck. The pain lasted two hours. Intermittent attacks of similar pain persisted for two weeks, to the time of her first visit. The heart sounds were of good quality; there was a cardiorespiratory murmur at the base of the heart; fluoroscopy revealed no cardiac enlargement. The blood pressure was 105 systolic, 75 diastolic. The electrocardiogram was negative. She was then well for two years, when, following the death of a cousin's baby, sticking precordial pain again developed, radiating to the left shoulder and arm, unrelated to exertion. She soon recovered and was again well for two years, when, following a miscarriage, she became irritable, cried readily, and had indigestion with vomiting and choking. The slightest aggravation or talking provoked sharp substernal pain, which radiated to the left arm and fingers. On walking five blocks she experienced needle-like chest pains, dyspnea and heaviness in the lower part of the sternum which compelled her to rest. Physical and roentgen examinations in January 1936 again were negative. The blood pressure was 110 systolic, 70 diastolic. The electrocardiogram was negative and unchanged.

Although precordial pain radiating down the left arm, associated with a sense of choking, at times provoked by walking, suggests angina pectoris, the youth of the patient, the repeated appearance of symptoms following psychic trauma, the free intervals, and the absence of objective signs after five years point rather to a benign form of precordial pain.

G. F., a woman, aged 45, while in a motion picture theater sixteen months before her first visit had an attack of severe pain in the left upper parasternal region and under the left breast, preceded by an uneasy nervous feeling in the left side of the chest. She was confined to bed for six weeks under the supposition that she had had a heart attack. She was subsequently warned by one of her physicians against climbing one flight of stairs lest she suddenly drop dead. After getting out of bed, she noted sternal choking on walking, radiating to the left breast and around the back, lasting ten minutes. Two weeks before her visit to us, following excitement, she experienced pain in the lower part of the sternum radiating to the left shoulder and left elbow, lasting about ten minutes. She complained of a constant precordial soreness and weakness, with exaggeration of the symptoms on slight activity. Physical examination was negative. The blood pressure was 118 systolic, 80 diastolic.

An electrocardiogram showed only left axis deviation. She was reassured and told that she had no heart disease. She was advised to increase her activities, and tincture of valerian was prescribed for the pain. She returned ten months later saying that she had become progressively better, especially with the use of valerian. She now walks six or eight blocks and becomes tired but has no chest pain. There is mild intermittent sticking pain in the left side of the chest unrelated to food or exertion but definitely related to changes in weather. She says that the strongest pains in the chest are readily relieved by the application of an electric pad. Physical examination and the electrocardiogram are unchanged.

In this case the diagnosis of a heart lesion and the enforced bed rest following an attack of benign chest pain led to persistent attacks of precordial pain, with radiation to the left arm and substernal choking, for a period of sixteen months. The symptoms were relieved by reassurance and suggestive therapy.

T. G., a woman, aged 44, stated in November 1935 that for two months exertion and excitement had induced attacks of midsternal pressure lasting from five to ten minutes. Walking five blocks or so brought on fatigue and dizziness, and if she quickened her step substernal pressure set in, forcing her to stop and rest for a moment. Under emotional stress she experienced substernal pressure, she became dizzy, her hands became ice cold, and she shivered and often cried. She had serious financial worries, her husband's income being only $15 a week. Physical examination was negative except for many extrasystoles. The blood pressure was 140 systolic and 90 diastolic. The electrocardiogram showed only many ventricular extrasystoles.

The outstanding fatigue and dizziness together with the occurrence of coldness, shivering and crying in the attacks are typical of an anxiety state.

Chest pain may develop in women who have nursed patients with coronary artery sclerosis or who have lost a relative or close friend from this disease. The readiness with which they may develop the classic pattern of angina pectoris is remarkable.

R. R., a woman, aged 49, felt responsible for the sudden death of her husband from heart trouble because she had not called a consultant during his final illness. Immediately after his death she complained of pain to the left of the sternum and in the left arm. She stayed in bed for three months while the pain continued steadily. Subsequently she would become weak and shaky on slight excitement. Physical examination revealed no abnormalities except slight dilatation of the aorta. The electrocardiogram showed only left axis deviation. Fourteen months later her physician reported that she was feeling well and had lost all the chest pain.

P. R., a woman, aged 47, stated in March 1932 that for six months she had had an almost constant gripping sensation to the left of the sternum, radiating to the left arm as a sense of weakness, aggravated by exertion. Nine days before her visit she was awakened by severe squeezing pain to the left of the sternum, radiating to the left elbow and left posterior part of the chest. The pain was of one hour's duration and was followed by residual weakness. Soon after the pain subsided she became aware of the action of her heart. She experienced at times sudden throbbing of the heart, accompanied by a momentary shock in the head. When she walked two or three blocks, palpitation set in, which caused her to rest. She was stout, and there was moderate left ventricular enlargement. The heart sounds were strong. There was a systolic murmur at the aorta and at the apex. The blood pressure was 135 systolic, 80 diastolic. The electrocardiogram showed left axis deviation, low voltage and a low T wave in lead 2. The diagnosis of coronary artery sclerosis was made at that time. She was not seen again until almost four years later, in January 1936. For three years she had felt fairly well, having had only occasional drawing pains in the left side of the neck and to the left of the sternum, at times awakening her from sleep and lasting from one to two hours. During the six months preceding her second visit she often awakened in the morning with a sinking feeling and weakness, lasting several minutes and relieved by brandy or spirit of ammonia. Two days before this visit she felt weak before retiring and was awakened early in sleep by a a sinking feeling, as she described it, which kept her awake all night. The following day she had unusual drawing pains in the neck and chest. She suggested that her present symptoms and attacks were of somewhat the same nature as those four years before. At present walking causes a sinking feeling and compels her to rest a few minutes, partly relieved by taking a deep breath. This necessity of taking a deep breath recurs frequently. Physical examination at this time was unchanged, except for some increased voltage of the T wave in lead 2.

In the light of the four year follow up and a closer analysis of the symptomatology with its characteristic functional stigmas, the original diagnosis of coronary artery sclerosis is most questionable. Of great importance in the entire sequence of events and in arriving at a diagnosis is the history of the illness of her husband, who was observed during the same period. He was first seen in November 1931 complaining of leg pains of several years' duration. Occasional precordial pain and oppression developed in December. In February 1932 he experienced a classic coronary thrombosis with positive electrocardiographic signs. He then was symptom free for three years, but during the past year he had a recurrence of pain in

the legs which occasionally awakened him from sleep. The development and remission of chest pain in the wife paralleled closely the evolution of symptoms in the husband.

The problem becomes more difficult when such pain occurs in women with hypertension, but also in these cases true angina is far from frequent, although precordial pain is very common. This is not astonishing in view of the marked disturbances of the vegetative nervous system that occur in most women with essential hypertension.

A. G., a woman, aged 42, seen in August 1930, had had the gallbladder removed when she was 32. At the age of 22 she experienced drilling precordial pain, radiating to the left arm, which was constant for some time and has always recurred with excitement. At the age of 38, following severe aggravation, precordial pain radiating to the left arm set in and forced her to bed for two weeks. For the two months preceding her first visit in 1930 she had attacks of numbness in the gums followed by epigastric pressure, which radiated to the left parasternal area. With this the left arm became numb and weak, the fingers white and cold. The attack was often accompanied by tremor of the whole body. On examination her face was flushed and she was nervous. The heart on fluoroscopy showed slight enlargement of the left ventricle and elongation of the aorta. The heart sounds were strong. The blood pressure was 150 systolic, 105 diastolic. The electrocardiogram was negative, showing only left axis deviation. The following month she reported that tincture of valerian had relieved her attacks. In 1932 while at the office she had one of her attacks. The face was flushed, respiration and pulse were rapid, and she cried. She was not seen again until four years later, in November 1935. Three weeks previously she had experienced sudden retrosternal pressure radiating to the left shoulder, which lasted for half an hour and was followed by persistent precordial pain and weakness. Walking did not aggravate the pain. Physical examination at present showed heart sounds of good quality and a systolic murmur at the aortic area. The blood pressure is 180 systolic, 100 diastolic; the electrocardiogram is unchanged.

F. A., a woman, aged 50, seen in July 1932, had had a thyroidectomy two months previously for a simple goiter of many years' standing. The menses were regular. One week previously, while lying awake in bed, she had experienced a severe, cutting pain from the midsternum through the chest posteriorly, lasting half an hour, followed by a succession of mild fainting spells. A constant gnawing pain in the midsternum appeared and lasted all the week. She was markedly obese. There was moderate left ventricular enlargement on fluoroscopy. The heart sounds were strong. The heart rate was 92. The blood pressure was 160 systolic, 110 diastolic. The electrocardiogram was normal, showing only left axis deviation. In November 1935 a right nephrectomy for hypernephroma was performed. When she was seen in December she stated that she occasionally had sharp pains under the left breast radiating through to the back, unrelated to walking or other exertion. She still had choking spells lasting a moment, unrelated to effort. The physical examination and the electrocardiogram were unchanged.

COMMENT

Case histories such as these could be multiplied many times. We present them with a certain hesitancy, so strongly do some of them suggest the presence of coronary artery disease. However, we have yet to see a woman with precordial pain, whether associated with hypertension or not, in whom the subsequent course of the illness indicated that our original diagnosis of benign heart pain had to be revised because of the development of objective physical or electrocardiographic signs of disease of the coronary arteries. And we have had the opportunity of following many patients for from two to five years. On the other hand, in not a few we have been compelled to discard an original diagnosis of angina pectoris in the light of the subsequent events. This record is not evidence of rare diagnostic acumen but rather is due to our awareness of the rarity of coronary disease in women, which made us weigh each case very carefully before placing it in this category. Knowledge of the frequency of disease is a great aid in diagnosis.

The clinical picture that simulates angina pectoris is by no means new. The nineteenth century literature is replete with papers on false or pseudo-angina, vasomotor angina, reflex angina, or secondary angina pectoris. The case reports reveal a preponderance of women. But knowledge of coronary artery disease in those days was very imperfect, so that many errors of diagnosis crept in. On the other hand, the practitioner of today has been drilled so thoroughly to associate heart pain with coronary artery disease that many of the niceties of diagnosis known to previous generations of physicians have been forgotten.

What are the features that distinguish this benign form of precordial pain from that of true angina pectoris? First of all the personality of the patient gives a clue. Women with benign precordial pain are usually anxious and high strung in contrast to the stolidity so often encountered in men with coronary artery disease. The symptoms are very prone to follow emotional or economic disturbances at home, such as the illness or death of a child, marital difficulties or financial stress. These women are always ailing, and even between attacks of severe pain they complain of lesser continuous pains, palpitation, dyspnea, vertigo and weakness. Frequently they take to bed after an attack of chest pain, and the duration of bed rest is out of all proportion to the severity of the attack. The usual patient with coronary artery disease feels well between his seizures.

Diagnosis is greatly aided if the physician is able to witness an actual attack of pain. This often bears the marks of hysterical seizure. The patient feels faint, her voice becomes weak, she gasps for breath and she tosses about and then falls back in a simulated faint, the eyes partially closed and the eyelids twitching, unresponsive to commands but aware of her surroundings. Often the limbs are rigid or there may be a shivering of the whole body—the so-called nervous chill. There may be palpitation; the hands and feet may be cold and pale, and the face flushed. The attack wears off gradually. Far too often the physician who is called administers a hypodermic injection of morphine and tells the patient and her family that there has been a heart attack. Not infrequently this diagnosis finally fixes the patient's attention on her heart and ever after all symptoms are referred to this organ. The differential diagnosis should not be difficult, for, as Allbutt [14] says, "these faintnesses, palpitations, gaspings, stiflings, bodily agitations, hyperesthesias and psychical commotions are as wholly unlike the ruthless grip of angina pectoris as their frantic alarms are unlike its silent passion." Even in milder attacks there are usually enough vasomotor signs accompanying the pain to make the diagnosis clear.

The character of benign precordial pain often serves to distinguish it from that of true angina pectoris. It is more apt to be diffuse or confined to the region of the apex; it is usually sticking and cutting in character rather than pressing. But these distinctions are not absolute, for either type of pain occurs in either condition. Radiation of the pain is of no differential value. Pain in the left shoulder and radiation down the left arm, or a sense of numbness or heaviness of the left

14. Allbutt, T. C.: Diseases of the Arteries Including Angina Pectoris, London, Macmillan Company **2**: 235, 1915.

arm, are very commonly associated with benign precordial pain. Both the precordial and the arm pain in these patients, however, are much more constant than is the rule in angina pectoris and are less commonly immediately provoked by exertion or even emotion. More usually they are later after-effects. After a severe attack of benign precordial pain one often observes prolonged residual pain or a precordial ache for days after the attack. This is unusual when there is organic disease, even after a coronary thrombosis. Precordial hyperesthesia is very commonly associated with benign chest pain. The patient cannot lie on his left side; he complains of the pain caused by the pressure of the stethoscope. Often during auscultatory examination the patient will halt the physician by saying "That is where my pain is, right under your stethoscope." Often this tender area is located over the fourth left costal cartilage. Such a tender cartilage may be so disabling and annoying that the term perichondritis has been employed to describe the symptomatology.

Kilgore[15] and Baker[16] have published studies of these chest pains. Baker followed forty-three women and nine men with inframammary pain for many years. She noted the intermittent sticking character of the pain, its indefinite relation to effort and its tendency to occur when the patient is tired and after exertion. She found that long remissions from pain are frequent and that relapses usually coincide with some illness or with extra physical or mental strain. In 392 consecutive cases she observed this pain in 42 per cent of patients without heart disease and in 22 per cent of those with organic heart lesions.

Women often experience chest pain while doing their housework but not while walking. This discrepancy in response to different forms of exertion may be due to the nature of household work, which calls for repeated bending while lifting children, cooking, reaching into the icebox, sewing, sweeping and scrubbing floors. Even in the absence of distinct osteo-arthritis of the spine one might expect a variety of chest pains and aches from repeated torsions of the chest and spine, especially in women over 40, in whom obesity and poor posture are so common. Many of these women feel better when they are walking in the open. In men, chest pain induced by occupational exertion is usually experienced as well when they walk, unless a definite postural cause of the pain exists.

The most characteristic feature of true anginal pain is its direct relationship to effort or emotional strain. The patient reports very simply and without dramatic embroidery that walking or lifting or excitement induces some form of sensation in the chest, or at times in the arm alone, which compels an arrest of activities. After a few moments' quiet the distress is gone and the patient feels as well as ever. In contrast to this simple, clear story the individual with benign precordial pain gives a highly colored version of sharp chest pains with all kinds of associated symptoms and vasomotor disturbances. She is not compelled to immobility by the disturbed functioning of her heart but lies down and rests and is overcome with bodily weakness, largely because of her apprehension.

Palpitation is commonly associated with benign heart pain. It may accompany the attack or occur during periods of freedom from pain. Commonly precordial pain comes at rest, palpitation on exertion. Often these patients are conscious of the beating of their hearts while resting in bed. Palpitation is rarely associated with true angina pectoris unless the attack is induced by a paroxysm of tachycardia or unless the anginal syndrome is complicated by hyperthyroidism. Patients with benign heart pain experience pain first; this is followed by apprehension and palpitation. When an attack of angina pectoris is released by a paroxysm of tachycardia, the patient first experiences palpitation and later on the precordial pain.

Treatment of benign precordial pain is difficult and often unsatisfactory. Some patients are relieved by simple reassurance, by the affirmation that they have no organic heart disease. In others, suggestive therapy is helpful; but all too often these simple measures fail. Frequently much harm is done by directing treatment to the heart or by prescribing drugs such as digitalis or aminophylline, which the patient soon discovers are cardiac remedies. Still greater is the havoc caused by an error in diagnosis, by the physician's statement, no matter how qualified, that the pain does arise in the heart. Many of these patients need skilled psychiatric treatment and would be much better off in the hands of psychiatrists than of cardiologists.

If the physician elicits the clinical history with the preconception that the patient has true angina pectoris, a fairly typical story of this disorder is usually obtained. The greatest care must be taken to avoid leading questions, to discover the real nature of the pain, its location, its duration, and its mode of onset and offset. Far too many patients are given angina pectoris by their physicians. Not a week passes but we see several patients invalided by an erroneous diagnosis of coronary artery disease. Such mistakes at times are due to ignorance, more rarely to cupidity. Most often the error can be traced to the fear of blame if death or serious illness follows after the physician has declared the patient free from organic heart disease. It takes courage to tell a patient with symptoms suggesting heart disease that he has no organic cardiac lesion.

The damage that can be done by a well meaning physician is graphically illustrated by the following case:

A woman, aged 44, had experienced while shopping, a strong aching pain in the upper left parasternal region, aggravated by deep breathing. The pain was of about ten hours' duration. She was kept in bed for three weeks and had mild recurrences of the pain during this period. Five weeks after the original attack a roentgenogram of the chest and an electrocardiogram were negative. A diagnosis of coronary thrombosis was made and communicated to the patient and her husband. A second complete examination five months later was also negative. She continued to have pain at intervals. It was a dull ache, quite persistent, which did not come immediately after exertion but some hours later. It would come in the evening after a heavy day, for instance. When we examined the patient ten months after the onset we found that she was nervous and apprehensive and was constantly blinking her eyes. The cardiovascular examination, including the electrocardiogram, showed no evidence of disease. The history, the nervousness and the negative examination indicated that there was no organic heart disease. The correctness of the diagnosis was supported by the manner in which it was received by the patient, her husband and her physician. Although it was impossible to discover the complete psychogenic background of the disorder, it was clear that the patient did not wish to lose her conversion neurosis, which ensured the solicitude of her husband and family; the husband, it appeared, resented the fact that his wife did not suffer from serious organic heart disease; the physician wrote us that our

15. Kilgore, E. S.: Angina Pectoris and Pseudo-Angina, J. A. M. A. **87**: 455 (Aug. 14) 1926.
16. Baker, Doris M.: Left Inframammary Pain, Lancet **1**: 1280 (June 14) 1930.

diagnosis might possibly be correct, but he would never take the responsibility of allowing the patient to incur the dangers of cardiac overstrain, and insisted on keeping her a chair-ridden invalid.

The relative unusualness of coronary artery disease and the frequency of benign precordial pain in women should lead to great caution in the diagnosis of coronary artery disease in women in the absence of hypertension or diabetes. This applies as well to many women in the fifth decade of life with unstable blood pressures and transient rises to 160 or 170 millimeters of mercury. The fluctuating blood pressure level may be only one expression of the many vasomotor instabilities associated with the menopause and does not have the same significance as a maintained arterial hypertension. Even in the presence of hypertension in women, true angina pectoris is much less frequent than is benign precordial pain. However, coronary artery disease does occur at times in women with normal blood pressures who are free from diabetes, particularly in women over the age of 60 who have generalized arteriosclerosis. Isolated cases in young women in the absence of both hypertension and diabetes have been reported.[17] When coronary artery disease occurs in women, its course and prognosis are much like those in the male sex.[18] The view that angina pectoris in women is less serious than in men is based on incorrect diagnosis, on the inclusion of many cases of benign precordial pain with those of true angina pectoris.

A minor point of practical clinical interest arises from this study. At times the differential diagnosis between coronary thrombosis and pulmonary embolism may be difficult. From an experience similar to that presented in this paper, Averbuck[19] has pointed out that "when the clinical picture suggesting coronary artery thrombosis occurs in a female patient who has neither arterial hypertension nor diabetes, a pulmonary embolus should be suspected." This point is made because of the relative frequency of pulmonary embolism in women under the age of 50, particularly in those who have been subjected to gynecologic operation.

The facts presented in this paper emphasize the need for further study of the relationship between arterial hypertension and coronary artery sclerosis. Coronary artery disease is much more common in men than in women. Arterial hypertension is more frequent in women than in men. Only 50 per cent of men with coronary artery disease have hypertension, whereas about 90 per cent of women with coronary artery disease have hypertension. Yet even in an office practice devoted mainly to cardiovascular diagnosis, only a third of the women with hypertension have symptoms of coronary artery disease. The connection, therefore, between hypertension and coronary artery disease is not a direct one. Hypertension is not the cause of coronary disease but simply accelerates its development. The designation "hypertensive cardiovascular disease," so commonly employed to describe these disease states, is a poor term. It assumes a necessary and fundamental connection between the two disorders. Their true nature can best be discovered by studying uncomplicated coronary artery disease in men and uncomplicated arterial hypertension in women. These apparently represent "pure forms" of these two conditions.

17. Rathe, H. W.: Sclerosis of the Coronary Arteries with Myocardial Infarct in a Young Woman, Am. Heart J. **9**: 539 (April) 1934. von Neusser, E.: Disorders of Respiration and Circulation: Angina Pectoris, New York, E. B. Treat & Co., 1909, p. 59.

18. Mullins.[9]

19. Averbuck, S. H.: The Differentiation of Acute Coronary Artery Thrombosis from Pulmonary Embolization, Am. J. M. Sc. **187**: 391 (March) 1934.

SUMMARY

1. Among patients referred for cardiovascular diagnosis, coronary artery disease was 4.9 times as frequent in men as in women.

2. All but 7.7 per cent of 169 women with coronary artery disease had either arterial hypertension or diabetes mellitus.

3. Coronary artery disease is infrequent in women, particularly in those under the age of 50, unless there is an associated arterial hypertension or diabetes mellitus.

4. Mistaken diagnoses of coronary artery disease in women are common because of the erroneous interpretation of symptoms, such as precordial pain with or without radiation to the left arm, a sense of choking, and fear of death. Such symptoms are common in the absence of organic heart disease.

1185 Park Avenue.

ARTIFICIAL FEVER IN THE TREATMENT OF GONORRHEAL OPHTHALMIA

W. T. HASLER JR., M.D.
AND
LOUIS SPEKTER, M.D.
DURHAM, N. C.

Fever as a therapeutic agent was introduced in 1918 by Wagner von Jauregg,[1] who reported use of malaria in the treatment of dementia paralytica. Soon, other fever producing substances were being used, such as intramuscular milk and peptone, streptococcus and typhoid-paratyphoid intravenous vaccines. With these methods the temperature is uncontrolled and generally of short duration, unless the divided dose method of intravenous typhoid-paratyphoid vaccine is employed.[2]

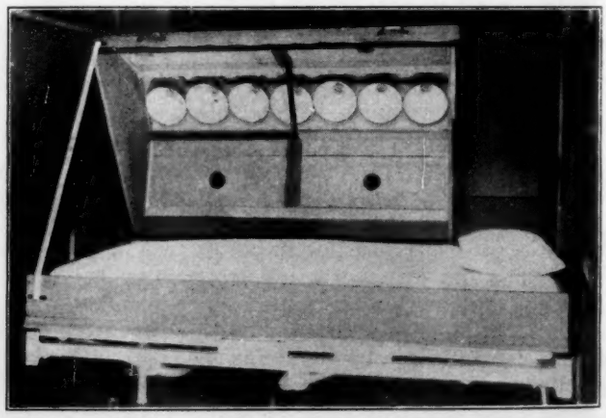

Fig. 1.—Cabinet for treatment.

Within the past seven years the therapeutic use of accurately controlled fever produced by physical means has slowly but surely supplanted the uncontrolled methods.

Diathermy, radiothermy, air conditioned cabinets, inductothermy and radiant energy may be used. We employ the latter because of its simplicity, low cost, and

From the Departments of Ophthalmology and Pediatrics, Duke University School of Medicine and Duke Hospital.

1. Jauregg, Wagner von: Ueber die Einwirkung der Malaria auf die Progressiva Paralyse, J. Psychiat. Neurol. Wchnschr. **20**: 132, 1918.

2. Nelson, M. O.: An Improved Method of Protein Treatment in Neurosyphilis, Am. J. Syph. **15**: 185 (April) 1931.

relative comfort for the patient. A complete description of the cabinet is reported elsewhere.[3] Briefly, it consists of a cellotex lined cabinet, heated by seven 120 watt carbon filament bulbs, which fits over a bed and encloses the reclining patient completely except for his head (fig. 1). For the treatment of ophthalmologic conditions a moist towel and an electric pad cover the eyes in order to maintain a high temperature.

Careful observation of the patient's condition before and during the treatment is absolutely essential, and only those who are willing to spend the time to observe the reactions should attempt this form of therapy. It must be emphasized that careful selection of the patient be made and contraindications to treatment noted; namely, cardiovascular, renal and liver disease, and a history of intolerance to heat, such as sun stroke. The infrequent severe reactions include persistent vomiting, circulatory collapse, tetany and convulsions. Although we believe that the benefits derived from the hyperpyrexia therapy outweigh the risk, it should be emphasized that the latter occur. Forty-nine deaths have been reported in a total of 4,809 patients treated (0.6 per cent).[4] At Duke Hospital approximately 430 fever treatments (at temperatures varying from 40 to 41.5 C.) have been given to 280 patients (thirty-three children, 247 adults). Four deaths have occurred (1.4 per cent). One of these patients had carcinomatosis, another had a history of sun stroke, the third was greatly debilitated; but in the fourth no apparent contraindications to fever therapy were present.

The physiologic reactions and the care of the patient during the therapy are described elsewhere.[5] During the treatment the patients receive subcutaneously or drink from 3 to 4 liters of water and from 10 Gm. (children) to 25 Gm. (adults) of sodium chloride supplied in the form of capsules or in a 0.6 per cent solution. Restlessness is allayed by sedatives, such as bromides or codeine. A typical chart showing the temperature, pulse, respiration and blood pressure of a patient during the treatment is given in figure 2.

Fever therapy has been used in various eye conditions: malaria for interstitial keratitis[6] and in the control of optic nerve atrophy,[7] and fever induced by physical means for corneal ulcer, acute iritis[8] and ocular syphilis.[9] However, we have found only two reports of the treatment of gonorrheal ophthalmia by controlled

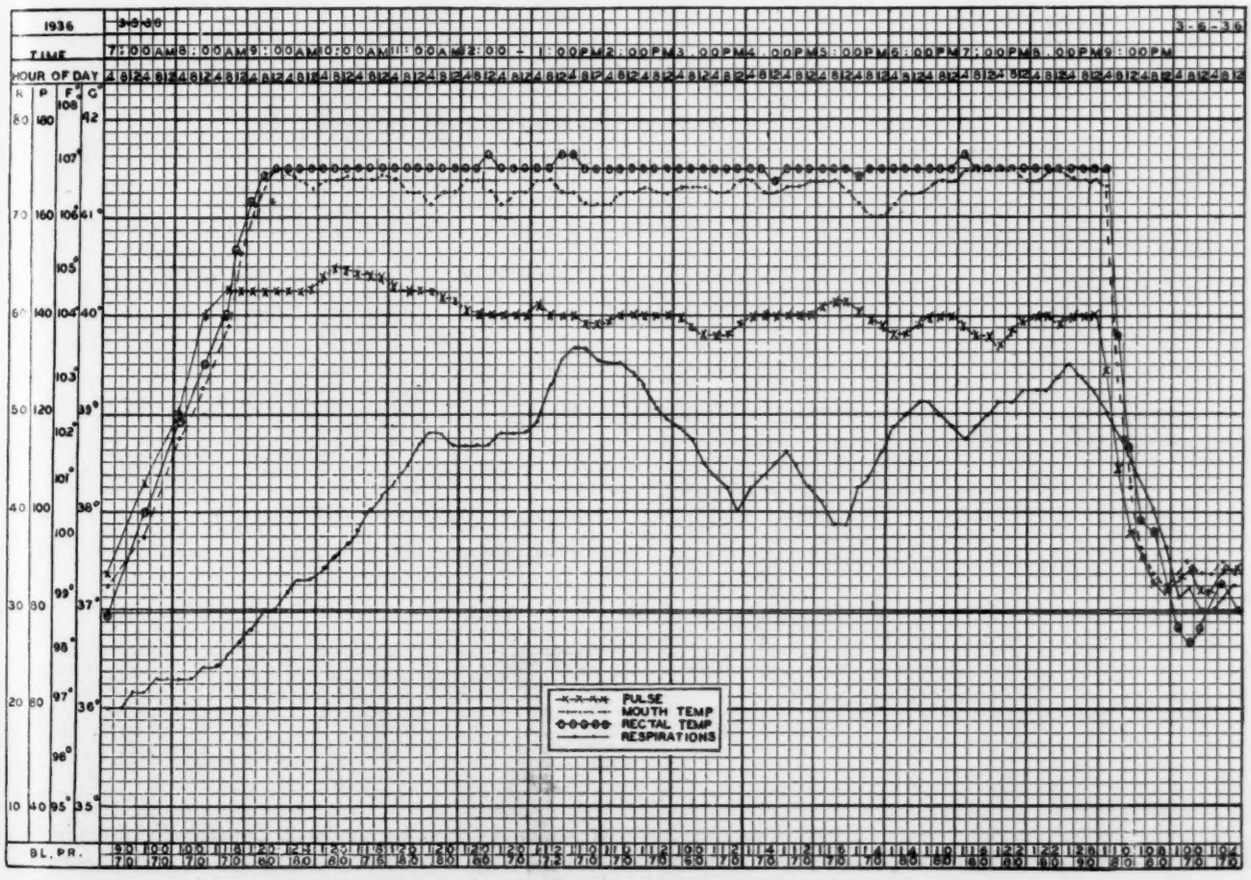

Fig. 2.—Temperature, pulse, respiration and blood pressure of a patient during treatment.

3. Bishop, F. W., and Warren, S. L.: Comparison of Three Electrical Methods of Producing Artificial Hyperthermia, J. A. M. A. **104:** 900 (March 16) 1935. Spekter, Louis, and McBryde, Angus: Effect of Hyperpyrexia in Various Pediatric Conditions, Am. J. Dis. Child. **48:** 933 (Oct.) 1934.

4. Report of Council on Physical Therapy: Hyperpyrexia Produced by Physical Agents, J. A. M. A. **103:** 1308 (Oct. 27) 1934.

5. Spekter.[3] Neymann, C. A., and Osborne, S. L.: The Physiology of Electropyrexia, Am. J. Syph. & Neurol. **18:** 28 (Jan.) 1934. Bishop, F. W.; Horton, C. B., and Warren, S. L.: A Clinical Study of Artificial Hyperthermia Induced by High Frequency Currents, Am. J. M. Sc. **184:** 515 (Oct.) 1932. Bierman, William, and Fishberg, Ella H.: Some Physiologic Changes During Hyperpyrexia Induced by Physical Means, J. A. M. A. **103:** 1354 (Nov. 3) 1934. Hench, P. S.; Slocumb, C. H., and Popp, W. C.: Fever Therapy: Results for Gonorrheal Arthritis, Chronic Infectious (Atrophic) Arthritis and Other Forms of Rheumatism, ibid. **104:** 1779 (May 18) 1935.

6. Ambler, J. V., and Van Cleve, J. V.: Malarial Therapy in Syphilitic Interstitial Keratitis, J. A. M. A. **102:** 1553 (May 12) 1934. Dennie, C. C., and McBride, W. L.: Treatment of Resistant Somatic Syphilis, Arch. Dermat. & Syph. **30:** 1 (July) 1934.

7. Clark, C. P.: Rôle of Malaria in Control of Atrophy of Optic Nerve Due to Syphilis: Study of Twelve Cases, Arch. Ophth. **15:** 250 (Feb.) 1936.

8. Whitney, E. L.: Artificial Fever Therapy in the Treatment of Corneal Ulcer and Acute Iritis, J. A. M. A. **104:** 1794 (May 18) 1935.

9. Culler, A. M.: Artificial Fever Therapy of Ocular Syphilis: Fifth Annual Fever Conference, May 1935.

fever.[10] As fever treatment of gonorrheal infections in various parts of the body is beneficial and as the lethal death time of Neisseria gonorrhoeae at 41.5 C. (106.7 F.) varied between six and twenty-four hours,[11] we treated six cases of gonorrheal ophthalmia with radiant energy (summarized in the accompanying table).

COMMENT

Treatments for five hours at 41.5 C. or lower (never higher) may be given instead of the twelve hourly period, which requires two or three shifts of nurses. However, more treatments will be required. During the first two or three hours of fever the conjunctival discharge diminishes rapidly in amount and the edema becomes less, allowing the irrigating solution to reach all parts of the conjunctiva. Toward the end of the treatment the changes have progressed, so that the cornea, which perhaps could not be seen well before treatment, because of chemosis, now can be more clearly observed. Irrigations may be continued with ease for the next few days. Gonococci, which still may be present, seem to be less resistant to antiseptics. Though irrigations may not be necessary, it is wiser to carry them out at intervals of four hours.

If the infection is not eradicated by the first treatment, the inflammatory process may recur in two or three days, when a second treatment should be given. Two treatments at 41.5 C. for from nine to twelve hours have resulted in bacteriologic cures in cases 1 and 2. In case 1 the corneal ulcer healed. In case 2 the simple conjunctivitis healed entirely. In case 3 negative smears were obtained one week after the second treatment. One eye was lost as the result of a perforated cornea, but the corneal ulcer of the other eye healed. In the other three cases one treatment produced negative smears. In case 4 healing occurred without any residua. In case 5 enucleation was necessary because of ulceration of the cornea and ophthalmitis. In case 6 a conjunctival flap was required because of a spreading ulcer. We believe this patient's cornea would have perforated and an ophthalmitis resulted without fever treatment. Only two of these patients had simple conjunctivitis, while four had varying degrees of corneal ulceration. The average length of hospitalization for these six patients was 15.3 days, including the postoperative days. The average length of hospitalization for six patients having gonorrheal ophthalmia treated by irrigations alone or together with intravenous typhoid vaccine was 25.2 days. In the four patients having genito-urinary infections the discharge ceased and gonococci disappeared from the smears.

Analysis of Cases of Gonorrheal Ophthalmia Treated with Fever

Case	Age	Race and Sex	Duration of Infection Before Treatment, Days	Gram Negative Diplococci in Eye Discharge	Condition of Eyes on Admission to Duke Hospital	Results after First Treatment, 12 Hours at 41.5 C. (106.7 F.)	Results after Second Treatment, 9-12 Hours at 41.5 C. (106.7 F.)	Condition on Discharge	Days in Hospital
1	7 yrs.	Colored ♀	8	+	Lids of left eye swollen and red, discharge profuse, corneal ulcers	Swelling and discharge absent, smears positive	Treated 12 hours; swelling and discharge absent, smears persistently negative, ulcer healing	Corneal ulcer healed, vision good	11
2	5 mos.	Colored ♂	4	+	Lids of left eye swollen and red, discharge profuse	Swelling and discharge practically absent, smears negative, left eye cleared	Treated because of infection of right eye, which cleared; smears persistently negative	Cured	14
3	6 yrs.	White ♂	8	+	Both eyes red and swollen; corneal ulceration, right eye, with prolapsed iris, corneal ulcer, left eye	Swelling and discharge practically absent, smears positive	Discharge and swelling absent, smears positive, becoming negative one week later	Right eye lost, corneal ulcer, left eye healed	20
4	20 yrs.	White ♂	7	+	Lids of right eye swollen and red, profuse discharge	Swelling and discharge absent, smears persistently negative	Not required	Cured	14
5	21 yrs.	Colored ♂	8	+	Lids swollen and red, deep marginal circular corneal ulcer, right eye, discharge profuse	Swelling absent, slight serous discharge, smears persistently negative	Not required	Eye enucleated	19
6	35 yrs.	Colored ♂	16	+	Lids swollen and red, purulent discharge, left eye, deep corneal ulcer	Swelling and discharge slight, ulcer still present smears negative	Not required	Conjunctival flap necessary, vision poor	24

SUMMARY

Necessary precautions for the safety of the patient include a careful study of his general physical condition before the treatment and careful observation while the treatment is being carried out. Contraindications include cardiovascular, renal and liver disease, and a history of intolerance to heat, such as sun stroke.

Six patients having gonorrheal ophthalmia were treated. In five, the organisms disappeared after one or two treatments. In the sixth the gonococci disappeared one week following the second treatment. This method of treatment is especially indicated when corneal complications are present.

We believe that fever therapy, when carefully carried out, is distinctly beneficial in gonorrheal ophthalmia. It causes subsiding of the inflammation and disappearance of the organisms, accelerates healing, and shortens the stay in the hospital.

10. Kendell, H. W.; Webb, W. W., and Simpson, W. M.: Artificial Fever Therapy of Gonorrheal Arthritis, Am. J. Surg. **29**: 425 (Sept.) 1935. Metz, M. H.: Some Unusual Cases Treated with Fever Therapy: Fifth Annual Fever Conference, May 1935.

11. Boak, Ruth A.; Carpenter, C. M., and Warren, S. L.: The Thermal Death Time of Neisseria Gonorrhoeae, Fifth Annual Fever Conference, May 1935.

A Man's Waist Measure.—According to a rule-of-thumb adage, "For every inch by which a man's waist measure exceeds his chest measure subtract two years from his life expectation." Any such rule is probably too simple to show fully the danger of extreme overweight; for the data tend to indicate that with increasing weight and age the mortality increases at an accelerating rate.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

FRACTURE OF THE NECK OF THE FEMUR

SIR ROBERT JONES LECTURE IN ORTHOPEDIC SURGERY

F. J. GAENSLEN, M.D.
MILWAUKEE

Fracture of the neck of the femur has been receiving increasing attention during recent years because of the general recognition of the fact that the results of treatment are far from satisfactory. My special interest in this field was aroused some seven years ago, through the failure to recognize an impacted fracture. The restoration of perfect function and of solid bony union in this case, in spite of a very brief period of protection from weight bearing, provided the stimulus for further study of this type of fracture. It is believed that the impacted fracture holds the key to a solution of some of the most important problems involved in the treatment of fractures of the neck generally, and that it is from the story of the clinical course of the impacted fracture that one can best understand the underlying principles involved in the healing process.

The reasons for the apparently uniformly successful results in impacted fractures of the hip of the type shown in figure 1 may be enumerated as follows:

1. Practically complete apposition of fragments.
2. Complete immobilization by reason of impaction.
3. Probable absence of serious damage to vessels carried by the capsula reflexa.
4. Absence of interposed capsule.
5. Resumption of early motion.
6. Relative infrequency of aseptic necrosis.

The surgeon, of course, will have no control over circulatory damage or inclusion of the capsule at the time of injury, but if the capsule can be released, as described later, it is believed that conditions are established conducive to early repair of vessel damage with probable avoidance of aseptic necrosis. The other points mentioned may be regarded as essential conditions that must be met or approached by any method of treatment hoping to compete in its results with those noted in the healing of impacted fractures. Assuming that reduction, by whatever method, has been accomplished, it is believed that adequate immobilization is secured more readily by means of internal fixation than by conservative methods now in general use.

A brief report of the case that provided the incentive for the present study seems warranted. I was called to see a woman, aged 52, who had fallen and injured her hip, Jan. 1, 1929. There was no shortening, rotation outward or other deformity. Motion was free and painless except at extremes. She was able to stand, to walk and even to squat down with little difficulty. A diagnosis of contusion of the hip was therefore made. A roentgenogram taken three days later showed a subcapital, impacted fracture. Since the patient had been permitted to walk without apparent detriment previous to a diagnosis of fracture, walking was continued, and the patient made an uneventful and complete recovery. My associates and I have seen seven other similar cases since then in all of which recovery occurred with relatively brief and simple support. In all there was impaction and in all there was a slight valgus deformity of the neck, so that weight was transmitted more perpendicularly and without the shearing action at the site of the fracture.

It was felt that the association of the valgus deformity with impaction was an essential factor in permitting this early function and that possibly this feature might be utilized in the treatment of fractures of the neck that were not impacted. Studies were therefore undertaken in the anatomic laboratory to determine what maneuver might be necessary to produce reduction with impaction and a slight degree of valgus to minimize the shearing force which it was believed was a potent factor in the production of nonunion. Eighteen dissecting room specimens, consisting of the intact femur and the corresponding half of the pelvis, were utilized. The muscles in these specimens had been cut away for the most part, but the capsule was generally intact. The upper portion of the pelvic half was countersunk in concrete and reinforced with wire mesh; likewise the lower end of the femur, including the condyles and the lower fourth of the femur. The specimens were then put in a testing machine (fig. 2), by means of which gradually increasing pressure was applied until a fracture occurred. The descent of the crushing weight was very slow, about fifteen hundredths of an inch to the minute. Fracture generally occurred in about five minutes. During this application of pressure the femur could be seen to bend slightly, and fat was observed exuding from the shaft. All the fractures occurred at the neck, none in the shaft, the force varying from 1,300 to 3,000 pounds. In the majority the fracture line extended vertically through the neck from the upper outer margin of the head toward the lesser trochanter in a line parallel with the shaft, thus producing an oblique fracture through the neck (fig. 3).

Fig. 1.—Subcapital, impacted fracture on the right. Note the slight valgus deformity resulting in weight being borne more perpendicularly and in reducing the shearing action at the site of the fracture.

In this process the capsule was not infrequently torn when the neck suddenly gave way, the tear invariably involving the posterior portion of the capsule, often extending to the superior portion. Not infrequently the capsule was caught between the fragments, as

Read at the Hospital for Joint Diseases, New York, Feb. 6, 1936.
Principles involved in reduction and healing, based on clinical experience and in part on experimental work carried on at the University of Wisconsin Medical School.

shown in figure 4. Attempts to produce impaction and slight valgus during abduction and traction in extension, the Whitman position, with pressure or a blow against the trochanter, with any force within reason, were unsuccessful. This experience tallies with the experimental work of Gill [1] and of Snodgrass.[2] The failure to obtain impaction is due to the fact that the

Fig. 2.—Method of producing fractures of the neck of the femur. The upper portion of the right pelvic half and the lower end of the femur are fixed in reinforced concrete. Gradually increasing vertical force is applied.

cortical bone of the neck is very dense and compact, thus lending itself very poorly to a meshing of the fracture surfaces. It must be remembered, however, that none of the fractures produced experimentally were subcapital, the usual type seen in impacted fractures. Had subcapital fractures been produced experimentally, it is quite likely that efforts at impaction might have been successful, since the cortical bone in the extreme upper portion of the neck is very thin and would allow meshing of the fractured surfaces with less difficulty. In a fall in the living the force producing impaction is probably greater than any force that would be justified in an artificial impaction, because of the danger of fragmentation. In these endeavors at reduction and attempted impaction it was further observed that the anterior portion of the capsule was never torn and that in abduction of the hip in the extended position the Y ligament, as pointed out by Whitman,[3] aided in bringing the fractured surfaces together by its action as a fulcrum, at the same time preventing any gaping of the fracture line below. Incidentally, actual impingement of the trochanter against the ilium was not observed. This again coincides with the experience of Snodgrass in his work on the cadaver.

The relation of the capsule to the fracture was of special interest. As already stated, the capsule was sometimes found interposed. It should be recalled that the capsule is attached above to the margin of the acetabulum and below to the intertrochanteric line, thus completely covering the neck anteriorly. Posteriorly the capsule is attached to just below the middle of the neck, the lower third of the neck not being covered. The capsule may thus be described as a skirt suspended from the margin of the socket, long in front and short behind. In fractures through the neck the capsule is apt to be torn close to the lower posterior attachment, the hem of the skirt. As the lower fragment is pushed up at the moment of fracture it carries the capsule with it, and as the femur is pulled down in efforts at reduction the capsule is wiped into the fracture cleft and is held securely. It is interesting to note that, while efforts to release the capsule by traction and extension failed, release was readily and invariably accomplished by flexion of the hip to 90 degrees. This is explained by the shortness of the skirt posteriorly. As the flexion increases, the fragments are pulled away from the capsule, since the upper attachment of the latter remains fixed to the acetabular margin.

In a number of instances it was found that traction on the extended extremity was ineffectual in restoring full length, owing to locking of the fragments, while, when upward traction was made with the hip flexed, full length was readily restored. It appeared, therefore, that withdrawal of the capsule from between the fractured surfaces as well as restoration of length, at least in some cases, could be more readily accomplished by the maneuver of flexion and upward traction than by traction in extension and abduction. In a few instances it was found that while shortening, that is, longitudinal displacement, was readily corrected, anteroposterior displacement sometimes persisted, the trochanter portion usually lying in a plane anterior to the normal. By alternating manual pressure on each side of the trochanter the fragments could usually be

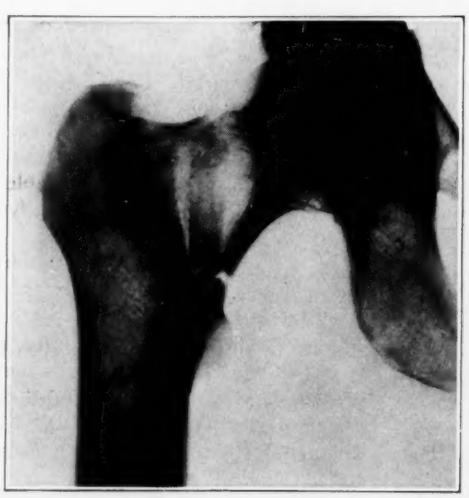

Fig. 3.—The common type of fracture of the neck produced as shown in figure 2.

brought to settle in proper position, thus correcting the anteroposterior displacement and producing practically perfect reduction.

The realization that impaction, to say nothing of impaction combined with slight valgus, was difficult or impossible to obtain led to an abandonment of efforts in this direction. This much, however, was learned: that in the laboratory practically anatomic reduction was readily obtainable by upward traction, as in the

1. Gill, A. B.: Treatment of Facture of the Neck of the Femur, Ann. Surg. **96:** 1 (July) 1932.
2. Snodgrass, L. E.: Fractures of the Neck of the Femur, Am. J. Surg. **27:** 487 (March) 1935.
3. Whitman, Royal: The Abduction Method, Am. J. Surg. **21:** 335 (Sept.) 1933.

Leadbetter [4] procedure. The method differs, however, from Leadbetter's in that extension is not added as a further step, since reduction is completed with the upward pull and further manipulation is unnecessary.

The problem, then, was to devise means of fixing the fragments immovably, with the hip and knee maintained in flexion of 90 degrees. This was accomplished

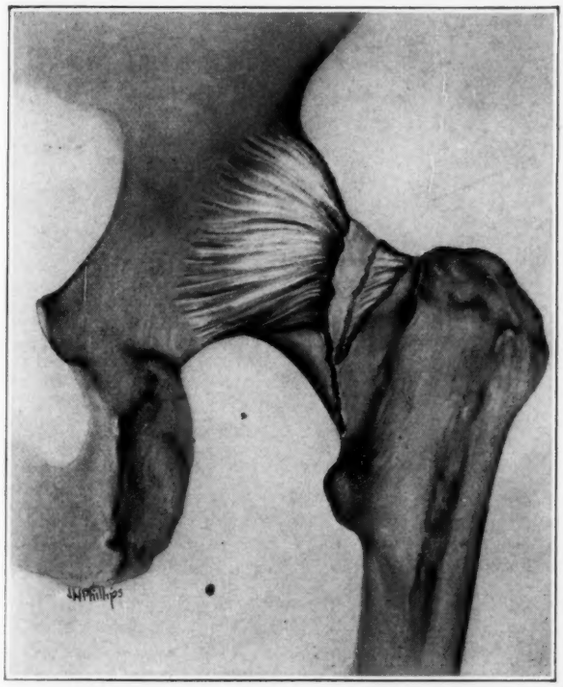

Fig. 4.—Inclusion of the capsule after reduction of fracture of type a shown in figure 3.

in the dissecting room specimens with three knitting needle spikes introduced under direct vision, the technic being modified for subcutaneous introduction of the pins in the living, as described elsewhere.[5] Since the extremities obviously could not well be held by an assistant during the nailing process, which required considerable time, the limbs were supported from overhead bars, some 8 or 9 feet above the floor level, high enough to allow ample clearance for the portable x-ray machine then used (fig. 5). This method of overhead support proved efficient, though cumbersome. About this time I was called to reduce a hip in a patient in a distant city. Because the overhead supports before used were not portable, some other plan for supporting the extremities had to be devised. Accordingly, plaster half-shells were made, from midthigh to toes, supporting both extremities in the position of flexion of both hips and knees at 90 degrees. The plaster half-shells were in turn supported by adjustable pedestals, as shown in figure 6. This form of support has proved satisfactory in that it is adjustable and portable. It is important that the pelvis does not rest on the table in order that one may have the benefit of continuous body weight traction, which serves to insure maintenance of proper relation of the fragments during the subsequent spiking. The pedestals supporting the plaster half-shells are therefore raised so that the pelvis swings free about an inch above the table top. An added advantage of the suspended pelvis is that the flat x-ray cassette can be placed under the patient's fractured hip (fig. 7 *A* and *B*) in taking the lateral view without disturbing his position. Abduction of the flexed thigh is added to coapt firmly, or to lock the fragments and also to make possible the taking of the roentgenograms in both anteroposterior (fig. 8) and lateral views without shifting the patient. A final step in the maneuver is the internal rotation of the thigh corresponding in degree to the angle of anterior torsion on the uninjured side, the average being about 12 degrees. The advantage of the abducted and internally rotated position lies in the fact that these maneuvers bring the neck parallel to the operating table and perpendicular to the table edge, materially facilitating the introduction of the spikes at proper angles.

Reduction by the maneuver described, namely, traction in flexion, appears to be based on sound anatomic and mechanical principles for the following reasons:

1. Flexion relaxes the anterior portion of the capsule and the Y ligament. It also relaxes some but not all of the important pelvifemoral muscles, as will be shown later.
2. The capsule, if interposed, is withdrawn as previously described.
3. Anteroposterior displacement, if present, is readily corrected by lateral pressure, the maneuver being facilitated by the suspension of the pelvis.
4. Tendency to redisplacement is minimized because of the steadying effect of the weight of the pelvis hanging from the femurs as fixed points.
5. The position makes possible the taking of repeated roentgenograms in both anteroposterior and perfect lateral views without shifting the patient during the sometimes tedious process of spiking.

While the statement that flexion relaxes the muscles about the hip joint, facilitating reduction, would probably go unchallenged at first glance, closer study shows that such a statement must be very definitely qualified.

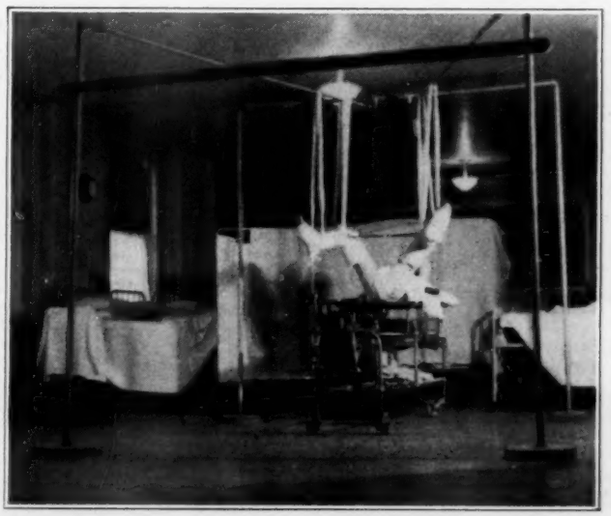

Fig. 5.—Overhead bars for support of the extremities with knees and hips flexed at 90 degrees.

In order to clarify this point, the following procedure was carried out: The origins and insertions of all muscles about the hip were marked with tacks driven into a skeleton, the heads of the tacks left projecting. Elastic cords representing the individual muscles were then attached to these tacks and the difference in the length of the cords was noted in the flexed position as compared to the extended position, as shown in the accompanying tables.

4. Leadbetter, G. W.: A Treatment for Fracture of the Neck of the Femur, J. Bone & Joint Surg. **15**: 931 (Oct.) 1933.
5. Gaenslen, F. J.: Subcutaneous Spike Fixation of Fresh Fractures of the Neck of the Femur, J. Bone & Joint Surg. **17**: 739 (July) 1935.

In table 1 are listed the muscles whose points of origin and insertion are approximated, with resulting relaxation favoring reduction.

In table 2 are listed the muscles whose points of origin and insertion are separated, with resulting stretching and hindrance to reduction.

It will be noted in table 1 that only the first four muscles enumerated were relaxed to any considerable extent and that, on the other hand (table 2), there was a definite and considerable elongation of the adductor magnus, the biceps, the semitendinosus and the gluteus maximus.

TABLE 1.—*Muscles Shortened by Flexion of Hips to 90 Degrees*

Sartorius	9.7 cm.
Gracilis	5.8 cm.
Tensor fasciae	4.4 cm.
Iliopsoas	3.5 cm.
Pectineus	2.3 cm.
Gluteus minimus	2.1 cm.
Gemellus inferior	1.8 cm.
Obturator externus	1.2 cm.
Pyriformis	0.0 cm.

Figure 9 shows a tracing of a lateral roentgenogram of the lumbar spine, pelvis and femur of a young man. There is noted the normal lordosis. The hip is in extension. The slightly oblique line bisecting the anterior superior spine and the middle of the greater sciatic notch is used merely as a convenient indicator of the position of the pelvis.

In figure 10 it is noted that the femur is flexed through 90 degrees. It should be observed also, however, that the pelvis is moved 48 degrees in the same direction, so that the actual flexion of the femur on the pelvis is only 90 — 48, or 42 degrees.

The tables of muscle relaxation and stretching are prepared from measurements in which the normal lordosis was undisturbed. In other words, there was an actual flexion of 90 degrees. When the lordosis is diminished, as in figure 10, relaxation of the anterior muscles is diminished, but this difference is offset by diminution also in the stretching of the posterior muscles.

One may summarize the results very briefly by saying that during hip flexion the muscles lying anterior to the hip joint are relaxed while those lying posterior to the joint are stretched. It is probable that during anesthesia muscle tension may be practically disregarded and that the advantage of the flexed position recognized clinically must be attributed to the relaxation of the anterior portion of the capsule, especially of the Y ligament, and of the fascia lata.

On reviewing the literature, reduction by traction in flexion is found to date back to Dupuytren,[6] who in his "Leçons orales," published in 1839, the year of his death, described the method in detail. The flexed position of the hip and knee was maintained until bony union occurred, a result which, according to his writings, occurred with regularity.

In figure 11 there is pictured the pillow support arranged according to the very careful description of Dupuytren, although no picture accompanied his text. He stresses particularly the need of having the pillows high enough to prevent the buttock from resting on the bed in order to get the proper traction effect. This method may well deserve consideration as a temporary measure in the very aged if the general condition does not warrant immediate reduction or as an alternative to that diminishing minority who still feel that it is best to make the patient as comfortable as possible and to avoid all attempts at reduction. It would at least have the advantages of avoiding decubitus and of really making the patients comfortable, with perhaps a chance of duplicating many of the happy results reported by Dupuytren. This author stresses the point that he was the first to advocate reduction in flexion and voices his astonishment that Potts, who had advocated reduction in flexion of practically all the long bones because of the advantage of muscular relaxation, had neglected to mention flexion as an aid in reduction of fracture of the neck of the femur.

In more recent times reduction in flexion was recommended by Maxwell [7] in 1876, by Ruth [8] in 1921 and by Leadbetter [4] in 1933. All these authors, however, added extension as a final step in the reduction maneuver. I should like to repeat that the method I described terminated with abduction and internal rotation of the flexed hip, extension being avoided as an unnecessary further step which might conceivably produce malalinement because of the constant tendency of the hip, when extended, to roll out.

The need for adequate fixation is now being generally recognized, but it was also recognized by many of the earlier writers, among them Senn,[9] who in his interesting monograph in 1883 stressed this point particularly and suggested a method of reinforcing the external fixation of the plaster cast with a pin incorporated in the plaster and engaging the trochanter. Among Senn's conclusions the following are of interest:

> The causes of nonunion are not to be found in the broken bone but in the difficulties encountered in treatment. All the various methods of treatment suggested and practiced have failed in securing perfect coaptation and uninterrupted immobilization (p. 102).
>
> If we could keep the broken surfaces in perfect coaptation and maintain reduction and immobility these fractures would heal in the same way as impacted fractures (p. 105).

The earliest reported transfixion was in 1850, thirty years before the antiseptic era, by von Langenbeck,[10] who succeeded in introducing a screw through a 1 cm. incision over the trochanter, fixing the fragments in perfect position. Unfortunately, his patient died of hospital gangrene, but in spite of this he expressed the firm belief that this method would find favor in the future. König [11] in 1875, using antiseptic precautions, succeeded in nailing a fracture of the neck of the femur in a youthful individual by introducing a metal drill

TABLE 2.—*Muscles Elongated by Flexion of Hips to 90 Degrees*

Adductor magnus	7.5 cm.
Biceps	7.5 cm.
Semitendinosus	3.5 cm.
Gluteus maximus	3.4 cm.
Quadratus femoris	3.2 cm.
Gemellus superior	2.0 cm.
Rectus femoris	2.0 cm.
Obturator internus	1.9 cm.
Adductor brevis	1.0 cm.
Adductor longus	0.9 cm.
Gluteus medius	0.8 cm.
Semimembranosus	0.6 cm.

6. Dupuytren, Baron G.: Leçons orales de clinique chirurgicale faites à l'Hôpital Dieu de Paris, ed. 2, **1**: 258, 1839.

7. Maxwell, T. J.: Intracapsular Fracture of the Neck of the Femur, Chicago M. J. & Examiner **33**: 401, 1876.

8. Ruth, C. E.: Fractures of the Femoral Neck and Trochanters, J. A. M. A. **77**: 1811 (Dec. 3) 1921.

9. Senn, Nicholas: Fractures of the Neck of the Femur, Tr. Am. S. A. **1**: 333, 1883.

10. von Langenbeck: Verhandl. d. deutsch. Gesellsch. f. Chir., seventh congress **1**: 92, 1878.

11. König: Discussion and Case Report, Verhandl. d. deutsch. Gesellsch. f. Chir., seventh congress **1**: 93, 1878.

through a small incision over the trochanter. Trendelenburg [12] appears also to have been intrigued with the idea of internal fixation. He reports having made numerous attempts on the cadaver to introduce a peg through the trochanter without free opening of the joint. He states: "Sometimes you hit it, more frequently you miss. With practice you may reach such dexterity that you can generally hit it, but it is easy to go by." Because of the difficulty of striking the head

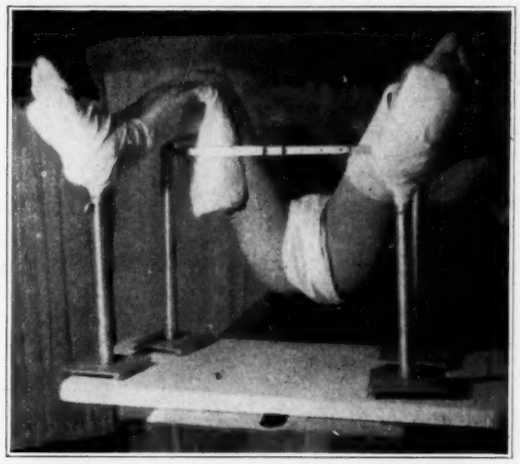

Fig. 6.—Extremities resting in plaster half-shells, which are in turn supported by pedestals adjustable as to height.

with the nail, he suggested exposure of the site of the fracture from behind, drilling the outer fragment from within, removing the drill and reinserting it from without to engage both the trochanter and the head fragments under guidance of the finger. Nicolaysen [13] reported thirteen successful cases of spiking without skin incision in 1897, using a three cornered nail driven directly through the skin without skin incision, although he used a plaster cast in addition. This was done without the use of the x-rays.

No attempt will be made to review the more recent literature, which abounds in reports of attempted internal fixation, many of the authors devising ingenious methods of spiking, either open or closed, and many with very encouraging results. Among these contributors may be mentioned Lemon,[14] T. Turner Thomas,[15] Smith-Petersen,[16] Sven Johansson,[17] Moore,[18] Knowles,[19] Wescott,[20] King,[21] Telson and Ransohoff [22] and Gaenslen.[5]

12. Trendelenburg: Verhandl. d. deutsch. Gesellsch. f. Chir., seventh congress **1:** 89, 1878.

13. Nicolaysen, J.: Lidt om Diagnosen og Behandlingen av Fr. colli femoris (A Little about the Diagnosis and Treatment of Fractures of the Neck of the Femur), Nord. mcd. arkiv. **8,** 1897.

14. Lemon, C. H.: Personal communication to the author.

15. Thomas, T. T.: Fixation by a Wood Screw Without Arthrotomy in Certain Fractures of the Neck of the Femur, Am. J. Surg. **35:** 292 (Sept.) 1921.

16. Smith-Petersen, M. N.; Cave, E. F., and VanGorder, G. W.: Intracapsular Fractures of the Neck of the Femur: Treatment by Internal Fixation, Arch. Surg. **23:** 715 (Nov.) 1931.

17. Johansson, Sven: On the Operative Treatment of Medial Fractures of the Neck of the Femur, Acta orthop. Scandinav. **3:** 362, 1932; Pseudarthrosis of the Neck of the Femur Treated by a Method of Extra-Articular Osteosynthesis, ibid. **4:** 214, 1933.

18. Moore, A. T.: Fracture of the Hip Joint (Intracapsular): A New Method of Skeletal Fixation, J. South Carolina M. A. **30:** 199 (Oct.) 1934.

19. Knowles, F. L.: Fractures of the Neck of the Femur, Wisconsin M. J. **35:** 106 (Feb.) 1936.

20. Wescott, H. H.: A Method for the Internal Fixation of Transcervical Fractures of the Femur, Virginia M. Monthly **59:** 197 (July) 1932; A Method for the Internal Fixation of Transcervical Fractures of the Femur, J. Bone & Joint Surg. **16:** 372 (April) 1934.

21. King, Thomas: Recent Intracapsular Fractures of the Neck of the Femur: A Critical Consideration of Their Treatment and a Description of a New Technic, M. J. Australia **1:** 5 (Jan. 6) 1934.

22. Telson, D. R., and Ransohoff, N. S.: Treatment of Fractured Neck of the Femur by Axial Fixation with Steel Wires, J. Bone & Joint Surg. **17:** 727 (July) 1935.

Accurate reduction and complete immobilization of sufficient duration must be considered the crux of the situation. Without these essentials one cannot conceive the reestablishment of the circulation across the fracture line, and on this reestablishment healing must ultimately depend. Other factors involved in healing are favorable or unfavorable solely, or at least largely, as they affect the circulatory damage.

While apposition of one half or even one third in fractures of the long bones is usually considered sufficient to secure union and a good functional result, there is no such margin of safety in fractures of the neck of the femur because of the well known fact that union is by endosteal rather than by periosteal bone formation. Schmorl [23] believes that this is due to the fact that the periosteum of the neck is entirely devoid of a cambium layer.

Reduction must be practically complete in order to supply a cross section sufficiently strong to carry the normal load. It is believed that in the vast majority of instances the circulation, impaired though it may be, is still sufficient for securing bony union, provided always that the repair process is favored by accurate apposition and perfect immobilization. When nonunion occurs it may generally be explained on the basis of interference with a circulation which under more favorable conditions would have been adequate to secure bony union. In support of this view the following considerations are deemed pertinent:

In subcapital fractures the plane of the break lies in the zone regarded by many as the most poorly supplied with blood. As a matter of fact, in the uninjured hip the subcapital area is very well supplied. A glance at dry femurs in the dissecting room will disperse any doubt on this point (fig. 12). In such specimens one will find a relatively large number of good sized nutrient foramina grouped on the superior

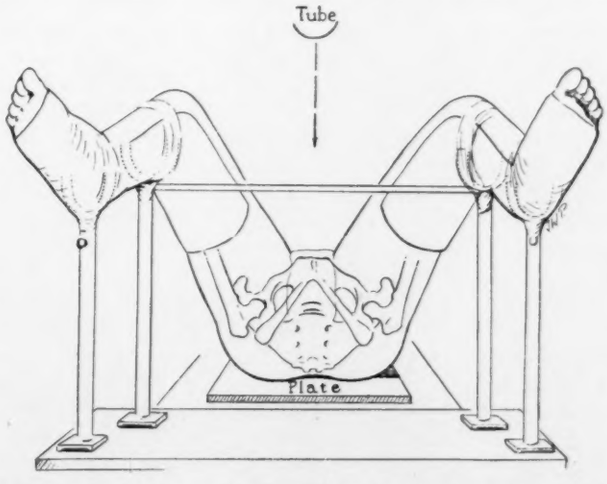

Fig. 7.—The author's method of obtaining lateral view of the hip after reduction and without shifting the patient.

surface of the neck close to the head, with a few scattered foramina on the posterior and anterior surfaces. In some of these dissecting room specimens, which for the most part were derived from older people, the nutrient foramina in the fovea, the attachment of the ligamentum teres, were few in number, rather minute and indeed more often than not absent altogether (fig. 13). In other words, the supply from the ligamentum teres, while variable, is frequently very

23. Schmorl, G.: Die pathologische Anatomie der Schenkelhalsfraktur, München. med. Wchnschr. **71:** 1381 (Oct. 3) 1924.

scant or absent, while that from the capsular vessels is relatively abundant. While anastomoses between these two sets of vessels has been denied,[23] Wolcott [24] has recently demonstrated by injection methods that such anastomoses do occur. In view of this, extensive injury to and inclusion in the fracture line of soft parts, capsule and synovial membrane must result in serious circulatory impairment. This in part explains the frequency of nonunion in the unimpacted

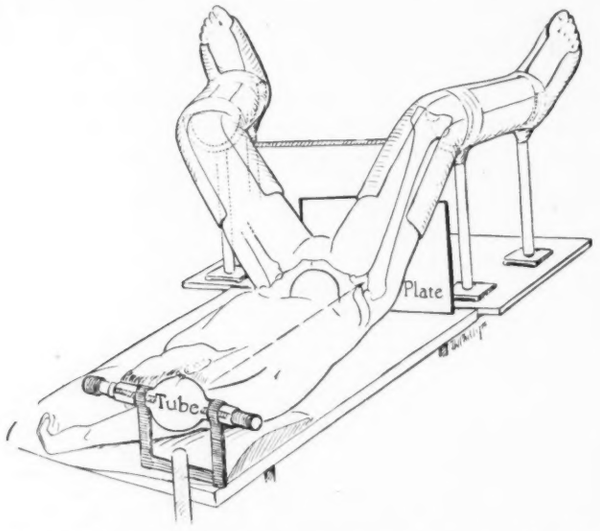

Fig. 8.—The author's method of obtaining anteroposterior view of the hip after reduction and without shifting the patient. Confirmatory roentgenograms in two directions have been insisted on for practically every other fracture. The procedure shown in figure 7 and here makes this possible for the neck of the femur.

cases. In the impacted cases there is in all likelihood no serious damage of the vessels and no inclusion of capsule. Immobilization, because of the impaction, is perfect and union is the rule. The relative infrequency or absence of aseptic necrosis in this type may also be taken as evidence of an adequate circulation. The comparatively large number of nutrient foramina for the capsular vessels carried by the capsula reflexa must be regarded as incontrovertible evidence of the abundance of blood supply in the uninjured part.

In case of fracture the situation is quite different. According to Schmorl, the blood supply from the capsular vessels may be seriously curtailed, depending on how much of the synovial membrane is peeled off from the neck and whether or not there is inclusion of the torn capsule between the fracture surfaces. In the case of capsular inclusion, which occurred in 75 per cent of his cases of subcapital fracture, he believed that the blood supply must be cut off practically completely, with resulting necrosis of the head. The loss of neck frequently observed, he believes, is due not so much to rubbing of the fracture ends, as advocated by Schanz, as to a resorption due to tearing of the synovial vessels, impaired nutrition of the neck and inactivity. On the basis of his pathologic examinations Schmorl concludes that inclusion of capsule and synovial membrane must not be underestimated in the production of nonunion, and he raised the question whether the difficulty of impaired circulation may be offset by suitable position and fixation without operative intervention. This question should probably be answered in the affirmative, because it is more than likely that early, careful anatomic reposition of the bone fragments by the method of flexion as already described will release the capsule and bring about restoration of fairly normal relation of soft parts, thus providing proper conditions for the reestablishment of circulation, just as one expects repair of vessel damage in torn ligaments in other situations.

The frequency of nonunion in the ordinary, nonimpacted cases cannot reasonably be attributed to lack of circulation. It is much more likely that the blood supply was in fact sufficient for bony union had immobilization been such as to favor repair of the circulatory damage. This is proved by the fact that the high Schanz osteotomy in cases of nonunion of long standing is followed by firm bony union at the site of the original nonunion in about 50 per cent of the cases. Schanz [25] had observed this late healing in old cases of nonunion and ascribed the unexpectedly happy results to the elimination of the shearing force at the site of the fracture, as shown in the following quotation: "Through the elevation of the neck the fracture site is placed below the head and the body weight no longer pushes the head downward past the fracture surface but directly against it. This provides more favorable weight bearing relations and may even lead to late bony union." The fact that the osteotomy is well below the fracture line and that the latter is not drilled or molested in any way would indicate that the circulation was adequate for healing at the time of the original injury and that union might as well have occurred first as last had proper immobilization been attained.

Schanz's pupil Pauwels [26] has elaborated on this idea of elimination of shearing force and adduced a mass of convincing evidence to prove the theory of Roux [27] that pressure stimulates bone production while tension inhibits bone production. According to this theory the connective tissue organization of the interfragmentary clot (bildungsgewebe) can be directed by means of mechanical stimuli to result in (1) bone, (2) connective tissue or (3) cartilage, depending on the character of the mechanical stimulus. Intermittent functional pressure will result in transformation of the precallous tissue into bone, while tension and shearing forces

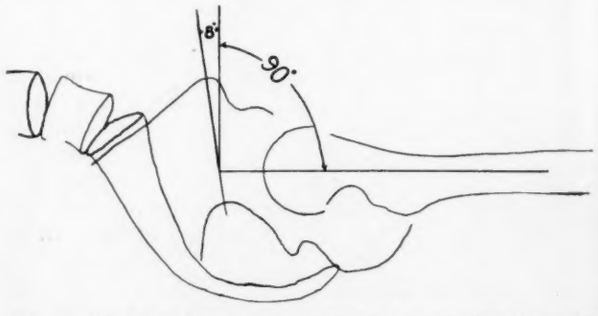

Fig. 9.—Tracing of lateral roentgenogram of the lumbar spine, pelvis and femur, the latter in normal extension. Note the normal lordosis.

inhibit bone production and result in connective tissue, a principle which Pauwels regards as of the utmost significance in consideration of the healing process of fractures of the neck of the femur. In the Schanz osteotomy cases the shearing force is changed into a force of intermittent pressure by the reduction of the fracture plane from a markedly oblique to one more nearly approaching the horizontal. In fractures ade-

24. Wolcott, W. E.: Circulation of the Head and Neck of the Femur, J. A. M. A. **100**: 27 (Jan. 7) 1933.

25. Schanz, A.: Ueber die nach Schenkelhalsbrüchen zurück bleibenden Gehstöringen, Deutsche med. Wchnschr. **51**: 732 (May 1) 1925.

26. Pauwels, Friedrich: Der Schenkelhalsbruch ein mechanisches Problem, Stuttgart, Ferdinand Enke, 1935, p. 6.

27. Roux, von Wilhelm: Gesamte Abhandlungen und Entwickelungsmechanik der Organismen, Leipzig, Wilhelm Engelman **1**: 357, 1895.

quately immobilized by means of internal fixation the shearing force is effectually eliminated, the thrust during weight bearing being converted into a pure pressure effect.

Adequate fixation implies complete immobilization not only for the usual period of twelve or even sixteen weeks but until bony union is well under way. Every one is familiar with the cases which look promising while in plaster but which show a gradual slipping

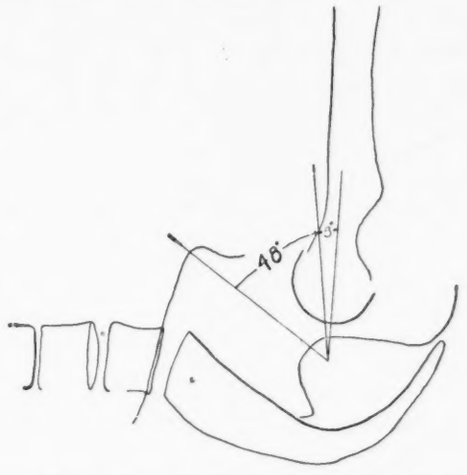

Fig. 10.—The femur is flexed through 90 degrees, but the pelvis is likewise flexed on the trunk through 48 degrees. The lordosis is lost. The actual flexion of the femur is therefore 90 — 48, or 42 degrees.

upward of the trochanter during the first weeks or months after removal of the plaster. This experience is so common that weight bearing is often prohibited for many months or a year. In spite of this, gradual giving way of the soft callus is observed all too frequently. This must mean that fixation in plaster or other conventional methods is inadequate. It is felt that the very slight movement allowed in the cast, especially in the case of stout individuals, no matter how carefully the cast may be molded, is responsible for a fair share of the failures. This gradual giving way is again the result of mechanical interference with the circulation and therefore with the healing process. The tendency of the unsupported hip to roll out, combined with the telescoping effect of contraction of the pelvifemoral muscles, must cause a tendency of the fracture to gape because of the repeated tension strain on the immature callus. The same lesson has been learned in the treatment of fractures of the carpal scaphoid. In this case, however, external fixation is sufficient if maintained for the proper period. In both these instances if fixation is inadequate, allowing even the slightest movement of the fragments one on the other, the process of bone repair dependent in turn on the repair of the circulatory damage is interfered with. Nature's efforts become exhausted and fibrous union results. With this clinical experience it is not strange that surgeons have turned to internal fixation as a more reliable method.

INTERPOSITION OF CAPSULE

Interposition of capsule is regarded by many writers as one of the important factors in the production of nonunion. Referring again to the high Schanz osteotomy for nonunion, it will be recalled that late union occurred in about 50 per cent after proved nonunion. If the capsule, as Schmorl found, is interposed in 75 per cent, it is more than likely that the capsule was interposed in at least some of the 50 per cent of cases in which bony union had been obtained after osteotomy. In other words, it would appear that late union can occur in spite of interposition of the capsule if proper mechanical conditions are provided and the shearing force is eliminated. The observation of Sven Johansson of x-ray evidence of beginning osseous union three months after internal fixation by means of a Smith-Petersen nail in a case of nonunion of fourteen months' standing may also be taken as supporting the view that an insufficient blood supply was not the explanation of failure in the first attempt, since the circulation proved adequate when proper fixation was established.

Can union occur in spite of interposed capsule? In order to test the importance of interposed capsule as a factor in nonunion, the following procedure was carried out on dogs: The femoral neck was cut through with a chisel, and a flap of capsule was turned into the fracture line, completely covering this. The flap was held in place with silk sutures. The hips were then spiked with three knitting needle spikes and the wound was closed. An effort was made to cut the neck off squarely and cleanly. In four the fracture was subcapital and in five transcervical. No external fixation of any kind was used. The operation was unilateral in seven dogs and bilateral in one, a total of nine hips in eight dogs (fig. 14).

OPERATION

A straight skin incision 10 cm. long is made, centering over the hip joint. Subcutaneous fat is divided and towels are applied to exclude the skin. Division of fascia by incision at right angles to the skin incision exposes the muscles overlying the joint. The biceps femoris which partially overlies the posterior portion of the trochanter is retracted backward. Muscle insertions overlying the trochanter are detached and reflected upward, exposing the capsule. The capsule is now thoroughly freed, and a large, square flap is cut corresponding to the outer half of the capsule. This flap is left attached below while the upper margin of the flap is cut close to the acetabular margin. Three sutures are now placed close to

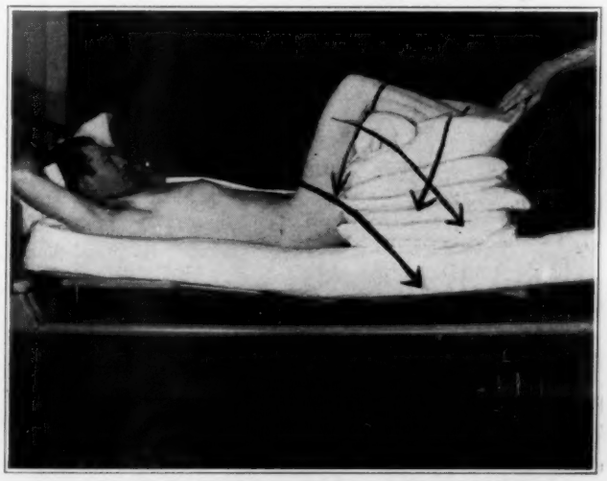

Fig. 11.—Dupuytren's method of securing traction in case of fracture of the neck of the femur. Two bed sheets placed over thighs and legs, respectively, as indicated by arrows in the diagram, and fastened to the frame of the bed, serve to maintain proper position.

the upper margin of the flap, one in each corner and one in the middle to facilitate secure interposition later. The ligamentum teres is not disturbed. With a large bone hook passed around the neck to steady the bone, the neck is now cut through with a chisel. A few black threads are now woven into the capsule to identify this structure, if possible, in later pathologic study. The capsule is now interposed, the silk stitches previously placed being carried with a sharp aneurysm needle for attachment to the medial portions of the capsule. The fracture is now reduced, the fragments being held in position during the

introduction of the three knitting needle spikes. The spiking is facilitated by partially drilling the trochanter and distal portion of the neck, at the same time tending to avoid displacement of the fragments during the spiking procedure. The muscles are now reattached to the trochanter. The fascia is closed with interrupted catgut, the skin with interrupted silk. The wound is dressed with a single layer of gauze 1 inch wide and the length of the wound, held in place with collodion. The stitches are not removed. They work out in from six to eight weeks. No fixation of any kind is used.

All the animals were adult and weighed approximately 35 pounds (16 Kg.). Dog 3 died four days after operation, apparently from the effects of previous experimental work having no relation to the present problem. Dog 6 died of wound infection eight days after operation. Dog 5 showed definite nonunion with marked displacement upward of the trochanter. In this case two Kirschner wires were used for the internal fixation rather than the heavier knitting needles, with the result that the wires broke and became displaced. This case must therefore be eliminated on the basis of inadequate fixation. In a sense, this dog did not die in vain, as the specimen may serve as evidence that nonunion in dogs can occur.

Eliminating three hips for reasons noted in the preceding paragraph leaves six hips for consideration. In one instance, the left hip of dog 4, union was only fairly firm because the animal was killed thirty-five days after operation on this hip. In the five other hips in which the dogs were allowed to live from four to ten months after operation union was firm in every instance. As to postoperative data, it may be said that weight bearing in walking as well as in running was resumed in from eight to ten weeks, sometimes with scarcely a perceptible limp.

As to pathologic changes, it was noted that in dog 1, in the right hip, there was partial luxation upward of the head with marked thickening of the upper acetabular margin, the lower half of the acetabulum being filled with a fibrocartilaginous mass. The capsule at the site of defect showed enormous thickening, evidently resulting from the need of support of the head to prevent further upward luxation. There was dense fibrous ankylosis at the hip joint, but in spite of this the dog bore weight on the leg in walking and in running with but a slight limp. In dog 2 there were no noteworthy pathologic changes. The cartilage of the head and acetabulum appeared normal. In dog 4 in the right hip there was noted a mild inflammatory reaction in the acetabular fossa, evidently the result of irritation produced by the projection of one of the nails about 1 mm. beyond the cartilage of the head. In dog 4, in the left hip, the trochanteric bursa showed slight increase in fluid with some fibrin and granulation tissue in the floor, the result of irritation of the ends of the spikes. There was a thin pannus covering about one fourth of the femoral head; otherwise the cartilage was normal. The fundus of the acetabulum showed deep, red granulation tissue. The specimen obtained from dog 5, the right hip, is especially interesting because it is the only case of nonunion. The head was found frozen into the acetabulum and rotated outward. The trochanter had ridden up so that the neck rubbed against the femoral shaft just below the fracture site, producing highly polished surfaces on both neck and shaft. Specimens from dogs 7, the right hip, and 8, the right hip, showed practically normal cartilage of the head and acetabulum. In none of the dogs was a defect noted in the capsule as the result of interposition of the flap. The repair was by fibrous tissue, in several instances thicker than the normal capsule.

Fig. 12.—Dry femur showing surface of neck. Note the many large foramina.

Fig. 13.—Dry femur. Note the absence of foramina in the fovea.

SUMMARY

It may be stated that, in the five cases in which reduction and spike fixation were satisfactory and of sufficient duration, firm bony union resulted. In one, union was fairly firm with every indication that firm union would have resulted had sufficient time been allowed. While "dog is dog and man is man and never the twain shall meet," the conclusion seems justified that union can occur in spite of interposition of capsule and that, if the circulatory conditions in dog and man are at all comparable, repair of the circulatory damage on which healing ultimately depends is possible, provided fixation eliminating the shearing force is adequate.

Within recent years aseptic necrosis has been recognized as a factor of very considerable significance in the problem of the fractured neck. No statistics were available to indicate the frequency of the condition. My impression, as well as that of colleagues with whom the subject was discussed, is that it is much less frequent in (1) impacted fractures and (2) in those cases in which reduction and internal fixation are satisfactory than in nonimpacted fractures treated by conservative methods. If for the sake of argument these assumptions are granted, one may speculate on the causes of this difference in incidence. The necrosis, of course, is due to lack of circulation in the head fragment. In the impacted fracture the circulation is much less damaged and fixation is efficient, allowing uninterrupted progress in repair. One must think of the initial repair process in terms of fine capillary shoots penetrating the "bildungsgewebe," attempting to bridge the gap. The smaller the gap and the more rigid the fixation, the more rapid the repair. In the impacted fracture these conditions are met perfectly. The gap is microscopic rather than macroscopic, and fixation is perfect.

In the nonimpacted cases treated with conservative means the circulatory damage incidental to tears of the synovial membrane and perhaps capsular inclusion is great and the processes of repair of vessel damage are constantly interfered with by movement of greater or lesser extent permitted in spite of careful application of the plaster cast. In the nonimpacted fracture treated by adequate internal fixation, movement is effectually eliminated and repair proceeds undisturbed. The cause

of the relative frequency of aseptic necrosis in the nonimpacted fracture treated conservatively must therefore be placed squarely at the door of inadequate fixation, interfering with circulatory repair. In this connection attention should be called to the work of Carey,[28] who measured the stress on the femur during contraction of the thigh muscles produced by the electric current. He removed a 2 inch (5 cm.) section from the middle of the shaft of the femur, replacing this with a hydraulic gage firmly secured by peg extensions into the open medullary canal of the upper and lower fragments. The force of the muscular contraction in the sense of stress on the bone was then readily measurable. His figures are astonishingly high, reaching a maximum of more than ten times the body weight of the entire animal. No analogous measurements are available for the neck of the femur, but because of the shaft neck angle it is readily seen that contraction of the powerful pelvifemoral muscles must result in a tremendous shearing force rather than in pure stress acting in a direction perpendicular to the cross section of the neck. Contraction of these muscles therefore, even if the patient is in a large double spica, may very well result in a slight shearing motion of the fracture surfaces, one on the other. This no doubt explains the occasional gradual upward riding of the trochanter due to yielding of the immature callus observed even before weight bearing, and sometimes indeed while the patient is still in the cast. In the fracture with satisfactory internal fixation, on the other hand, muscular contraction can result only in intermittent pressure in the direction of the longitudinal axis of the neck—pure stress devoid of shearing factor and therefore in stimulation of bone formation.

One point with reference to aseptic necrosis should be cleared up. Reported changes in femoral heads coming on years after fracture, when until then no increased density of the head was noted as compared to the rest of the bone, must be classified as something other than aseptic necrosis. Just as in osteomyelitis one expects to recognize a sequestrum within a period of three or four months because of the retention of the calcium salts in the fragment deprived of circulation and the carrying off of the lime salts in the living bone, so one should be able to recognize necrosis of the head fragment when it exists, within a reasonable period of time. It is inconceivable that the circulation should be competent for months or years and then fail with resulting necrosis. To me it seems that some of the cases in question must be classified as osteo-arthritis, the changes undoubtedly coming on more rapidly because of the joint damage sustained at the time of injury.

The importance of early activity as a factor promoting union is probably very considerable. It is being stressed more and more in the treatment of fractures in general. It is believed that no one will question the wisdom of early movement at neighboring joints so long as the fragments themselves remain securely fixed. In fracture of the ribs, where motion is uninterrupted because of respiratory movements and where fixation due to the splinting action of the adjacent ribs is efficient, fractures heal promptly and nonunion is probably unknown. Clinical evidence of the low ebb of metabolism during inactivity is furnished by the fact that encasement of a child's leg in plaster will cause sufficient bone atrophy within six weeks to allow manual breaking with but little difficulty. Clark and Swenson [29] in studying the circulation in the rabbit's ear have demonstrated on the moving picture film that gentle stroking of the ear will transform narrow, sluggish capillary streams into what looked like raging torrents under the microscope. Since massage is but a poor substitute for muscular activity, the inference is no doubt correct that the blood supply during activity is vastly increased over that in a state of rest. In the impacted fracture and in the spiked fracture one has assurance of secure fixation so that early, in fact immediate, motion within reasonable limits is not only permissible but indicated. Waldenström,[30] an advocate of spiking rather than plaster fixation, suggests that early motion is conducive to improvement of the circulation through the vessels of the ligamentum teres, the alternating stretching and relaxation of the ligament assisting in pumping the blood along its course. Certainly retention for months in plaster with the ligamentum teres stretched taut and compressed, as it must

Fig. 14.—Roentgen appearance of pelvis and hips of dog 4 after fracture of the neck of the right femur, interposition of flap of capsule, reduction and spiking. Firm union resulted in spite of the interposed capsule.

be in the widely abducted and extended position, is not compatible with abundant blood supply. Indeed, thrombosis of the vessels under such conditions would probably be a frequent finding if pathologic evidence were available.

While encouraging reports of internal fixation are at hand from many authors, each developing his own technic, not enough time has elapsed to permit one to speak of end results. It appears likely, however, that end results will be reached earlier in those cases in which internal rather than external fixation is used, since conditions established by internal fixation are more or less comparable to those obtaining in the impacted cases. Complications and mishaps may be expected in any new procedure, and indeed many have been reported; but each such incident has been a lesson, often pointing the way to avoidance of danger. It is to be hoped that out of the many procedures, all differing somewhat in technical details, some method or methods

28. Carey, E. J.: Experimental Physiologic and Pathologic Muscular Back Pressure and Its Relationship to the Formation, Regeneration and Deformation of Bone, Anat. Rec. (supp.) **48**: 12, 1931.

29. Clark, E. R., and Swenson, E. A.: Anatomical Dept., University of Pennsylvania.

30. Waldenström and Henning: Necrosis of the Femoral Epiphysis Owing to Insufficient Nutrition from the Ligamentum Teres, Acta chir. Scandinav. **75**: 185, 1934.

more or less generally applicable will be developed so that in the hands of skilful surgeons in well equipped hospitals the percentage of success will be materially increased.

It is recognized that no one method of reduction will fit all cases; also that not all cases properly reduced and properly spiked will go on to solid union. It is believed, however, that there is sufficient evidence, clinical and experimental, that internal fixation has decided advantages over external fixation and that present day conventional methods, while representing a distinct advance as compared with earlier methods, will give way to more precise and more certain procedures.

In the foregoing an attempt has been made further to rationalize, first, the method of reduction of fractures of the neck of the femur by traction in flexion and, secondly, the method of internal fixation. This attempt is based in part on clinical observation and in part on experimental studies on the skeleton and on animals. If this presentation [31] will serve in some small measure in placing internal fixation on a sound basis and in stimulating continued efforts at perfection and simplification of the technic, insuring a wider acceptance, its purpose will have been accomplished.

425 East Wisconsin Avenue.

THE TREATMENT OF CHRONIC VARICOSE ULCERS

BY MEANS OF ACETYL-BETA-METHYLCHOLINE CHLORIDE IONTOPHORESIS

LESLIE SAYLOR, M.D.
TOPEKA, KAN.
JOSEPH KOVACS, M.D.
A. WILBUR DURYEE, M.D.
AND
IRVING WRIGHT, M.D.
NEW YORK

Chronic ulcers, associated either with varicose veins or with the occlusions following phlebitis of the deep veins, constitute one of the most severe and disabling conditions affecting the lower extremities. Despite the numerous forms of treatment, including vein injection, recommended during the past fifty years, certain of these ulcers fail to heal. This is a report of the results of a new method of treatment of these ulcers, which appears to be more satisfactory than any hitherto suggested.

The formation of varicose ulcers is now generally accepted as being the result of venous stasis, secondary to the dilatation of the veins and weakening of venous valves. This produces an increasing backpressure into the capillary bed, with the development of pressure edema and the waterlogging of the tissues. With the associated anoxemia, impaired nutrition and accumulation of toxic waste products of metabolism, the resistance of the tissues to trauma and infection is reduced. Chronic ulceration may then occur, following the slightest bruise, abrasion, infection or even spontaneously. A similar process frequently follows deep phlebitis. In many instances, both phlebitis and varicose veins play a part in the production of such ulcers. There has been no difference in response to this treatment, so that we have not subdivided these groups in this report.

The actual ulceration may begin with a gangrene and separation of the superficial layers of the skin, or pieces of wet, dead tissue of varying sizes, representing the entire thickness of the skin, may come away from time to time. In certain instances a portion of the external wall of the vein sloughs away with its covering of skin. These ulcers are usually irregular in shape; only the deeper seated, lacunar ulcers are round or oval. These ulcers can usually be differentiated from syphilitic ulcers, which are more clearly "punched out." Blood studies should be used, nevertheless, to clear up this point in each instance. The size varies from that of a pinhead to ulcers of huge size. The largest in our series was 11 by 6 cm. The base of these ulcers is usually covered by a slough, with abundant seropurulent discharge present. The surrounding area is most often indurated, edematous and markedly pigmented.

Logically, the healing of varicose ulcers should be dependent on an increase in the local circulation and the elimination of local edema and anoxemia, with accompanying improvement in the nutrition of the tissues. Many of the previous forms of treatment, such as rest and elevation, elastic bandages, rubber sponge pressure, bandages, "Unna's boot," injection and ligation of veins, have been used in an attempt to promote this physiologic state.

Dianow [1] reported in 1930 thirty cases of varicose ulcers treated by acetylcholine (0.1 Gm. daily subcutaneously) in addition to the usual treatment of rest in bed and wet dressings or ointments. Except for one failure, all (about 97 per cent) healed in six weeks. Of 109 previously treated in the same way without acetylcholine injections, 31 per cent failed to heal, and forty-nine of the ulcers required more than six weeks to heal.

Because we believed that the local induction of vasodilating drugs might be even more effective in stimulating the circulation and hence in healing the varicose and postphlebitis ulcers, we used acetyl-beta-methylcholine chloride [2] by the method of iontophoresis, as first described from this clinic.[3] A preliminary report of nine cases successfully healed by this method was included as a part of a broader study presented before the Section on Pharmacology and Therapeutics of the American Medical Association in June 1935.[4] These patients had had their ulcers for from seven months to thirty-seven years, without relief from any previously used treatment.

In this paper we present the results of the treatment of the first twenty-six consecutive cases of varicose and postphlebitis ulcers that have come under our care since we began this form of treatment. No selection of cases was undertaken. We would stress the following conditions of our experiments:

1. With three exceptions, our patients had been through a control period ranging from one to thirty-seven years, during which time all recognized forms of

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31. The author is indebted to the late Dr. M. G. Millar for help in the work on experimental fractures, to Dr. H. W. Wirka of the orthopedic staff of the University of Wisconsin Medical School in the work on dogs, and to Dr. A. C. Schmidt in the study of the effect of hip flexion on relaxation of muscles.

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Read before the Section of Medicine, New York Academy of Medicine, Dec. 17, 1935.
From the Vascular Clinic of the Department of Medicine of the New York Post-Graduate Medical School and Hospital of Columbia University.

1. Dianow, I.: Du traitement des ulcers variqueux par d'acetylcholine, Rev. méd. de la Suisse Rom. **50:** 277, 1930; J. de méd de Paris **50:** 619, 1930.

2. The acetyl-beta-methylcholine chloride (Mecholyl) used in these studies was supplied through the kindness of Merck & Co., Rahway, N. J.

3. Kovacs, Joseph: The Iontophoresis of Acetyl-Beta-Methylcholine Chloride in the Treatment of Chronic Arthritis and Peripheral Vascular Disease, Preliminary Report, Am. J. M. Sc. **188:** 32 (July) 1934.

4. Kovacs, Joseph; Saylor, Leslie, and Wright, I. S.: The Pharmacological and Therapeutic Effects of Certain Choline Compounds, Am. Heart J. **11:** 53 (Jan.) 1936.

treatment for this condition had been tried on one or more of them without success.

2. During our period of treatment, no patients were hospitalized or put to bed. On the contrary, all were urged to continue their daily occupations, which included washing, ironing, chopping wood, cooking, and selling real estate.

Fig. 1 (case 14).—S. L., a man, aged 30; duration of ulcer, four and one-half years; size, 1.25 by 0.75 cm.; duration of treatment, three weeks; number of treatments, twelve. Appearance of ulcer July 26, 1935.

3. No other form of treatment was used. (A plain petrolatum dressing was permitted during the early stages of the treatment, if it made the patient more comfortable.)

4. No patient received injections for varicose veins during the course of this iontophoresis treatment. After the ulcers had healed, we had the veins injected, when indicated.

The technic of this form of treatment, together with descriptions of local and general reactions, has been described previously by us.[5] We summarize this material here only briefly.

TECHNIC

A standard 0.5 per cent solution of acetyl-beta-methyl-choline chloride is used. Reinforced asbestos paper is saturated with the 0.5 per cent solution of the drug and wrapped around the foot and leg as high as the knee. The ulcerated area is not covered during treatment until a firm scab has formed over it. After this has occurred, the application may be made directly over the healed area also. A malleable metal plate is placed over the wet asbestos paper and connected to the positive pole of a galvanic machine. The metal plates are never applied over the ulcerated area. A large, regular moist pad electrode is used as a dispersive electrode. This is placed under the back and connected with the negative pole. The current is turned on and slowly increased to 20-30 milliamperes. At the end of the treatment, the current is slowly reduced and turned off. Treatment is given in some cases daily, but generally two to three times weekly for from twenty to thirty minutes.

5. Kovacs (footnotes 3 and 4.)

GENERAL REACTIONS

A moderately severe reaction resulting from this iontophoresis treatment might be characterized by (1) a marked flush extending over the face, chest and upper part of the abdomen; (2) increase in pulse rate; (3) a deeper, slower respiration cycle; (4) a marked drop in blood pressure (which has been so profound on several occasions that it was necessary to terminate the experiment with atropine); (5) marked salivation (in one instance as much as 140 cc. of saliva was collected in twenty minutes); (6) marked lacrimation; (7) profuse diaphoresis; (8) increased intestinal peristalsis with abdominal griping and occasional immediate defecation; (9) occasional substernal pressure; (10) diuresis, in certain individuals, to a varying degree; (11) changes in the electrocardiogram resulting in temporary inversion of the T waves in one or more leads; (12) slight cyanosis at the tips of the extremities, with a drop in surface temperature, which usually rises above the original level in from one to six hours. If desired, immediate cessation of effects may be produced by the injection of atropine, one one-hundredth grain (0.00065 Gm.) subcutaneously.

These systemic reactions constitute an exact duplication of the reactions following the subcutaneous or intravenous administration of the same drug but are more certain, more prolonged and more easily controlled. They are rarely noted with iontophoresis, except in a mild form.

Fig. 2 (case 14).—Appearance Aug. 23, 1935: ulcer healed; only scaling and pigmentation remain.

LOCAL REACTIONS

In addition, there is a characteristic local reaction, directly under the site of the application of the drug. This consists of (1) a feeling of prickling followed

by warmth during the treatment; (2) the appearance of goose-flesh immediately after removal of the asbestos paper; (3) a local blush of the skin; (4) sweating of the skin, which may continue from six to eight hours; (5) an elevation in surface temperature, during treatment, followed by a drop during profuse sweating

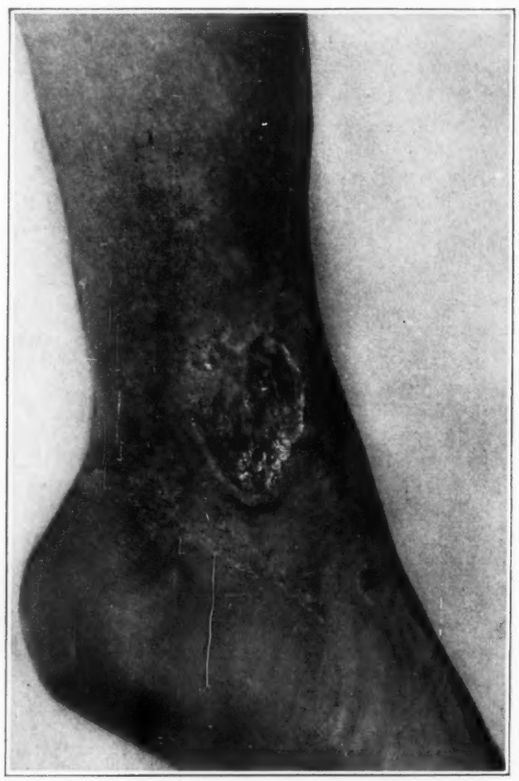

Fig. 3 (case 17).—U. H., a woman, aged 63; duration of ulcer, two years; size, 5.5 by 8 cm.; duration of treatment, twenty weeks; number of treatments, 100. Appearance of ulcer April 10, 1935.

(with accompanying evaporation) and a rise above the former level in from one-half to five hours.

Neither the general nor the local effects noted can be produced with the use of saline iontophoresis or by the galvanic current alone. Likewise they cannot be produced by merely soaking the area in the solution or by using an ointment containing up to 25 per cent of the drug. Acetyl-beta-methylcholine chloride solution plus the use of the galvanic current must, therefore, be responsible for the effects.

Individual variations in reactions are noted, as in the use of most drugs. Some individuals who scarcely react to the first treatment show an increasing reaction to subsequent treatments.

RESULTS

Twenty-six patients with varicose ulcers have been treated by acetyl-beta-methylcholine chloride iontophoresis. The age, the duration and size of the ulcers, the duration and number of treatments and the results in each case are given in the accompanying table. Of the twenty-six patients, only three did not have satisfactory results. The histories of these three cases are as follows:

The first case with an unsatisfactory result was that of a woman (patient 3) with a postpartum phlebitis and varicose ulcer of eight years' duration. She had been bedridden for seven months before we started treatment. The ulcer was healed after twenty-one treatments, but, when thyroid extract was given by the family physician in doses up to 4-6 grains (0.26-0.4 Gm.) a day, to help the patient reduce, the ulcer promptly recurred and could not be rehealed. The patient was overweight, although the basal metabolism was normal. We are unable to state definitely the cause of the recurrence at this time.

The second patient was S. E. (24), a man, aged 31, who had two large varicose ulcers of four years' duration on the left leg. One of these was a punched-out ulcer at the middle of the calf, 2.5 cm. in diameter, surrounded by a discolored, brawny, scaly, edematous area, 1.2 by 8 cm. in size, in which several small (pinhead sized) ulcers were present. These ulcers healed after twenty-four treatments and the surrounding area was much improved. The other ulcer was located over the internal malleolus. This was 4.5 by 2.25 cm. in size, punched out, and surrounded by an inflamed, edematous, indurated area of 10 by 5 cm. This ulcer showed no improvement after forty-two treatments. This patient is a cook and must stand on his feet steadily for ten hours a day without rest. Although we have urged all our patients to continue with their daily occupations, because this individual was on his feet more steadily than any other persons in the series, because this ulcer always became more inflamed and painful during the latter part of each day's work, and because we feel that this patient has a complicating deep-vessel phlebitis, it would seem likely, in this one instance, that hospitalization would be necessary to insure a reasonable chance of healing the remaining ulcer.

The third patient, B. G. (22), had only four treatments in the course of one week and then had to return to his home, about 150 miles from New York. His family physician is now giving these treatments under our guidance.

COMMENT

The mechanism by which this healing is accomplished is not clear. Two explanations seem possible. The

Fig. 4 (case 17).—Appearance Aug. 13, 1935: ulcer healed; only scaling and pigmentation remain.

results may be due to either one or to a combination of the two. The production of an increased local circulation may promote a more rapid removal of the waste products and increase local nutrition, thus producing regeneration of the tissues, or, secondly, the marked local diaphoresis, which may continue for from

four to eight hours after the treatment, may reduce the edema resulting from the hydrostatic pressure, and, by relieving the tissues of this overload of fluid, may permit healing. We realize that it is preferable to close the causative veins as part of the treatment and have recommended injection therapy in suitable cases at the conclusion of the experiment. It is to be expected that, if the etiologic factors are not removed, all ulcers of this type will tend to recur unless treatment is continued. There are, however, ulcers which do not heal after injections and other cases in which injections are not to be recommended, as, for example, with diabetes or phlebitis. In these groups, this form of treatment should have especial value. We find such patients quite willing to continue to take treatments once a week or every ten days, to prevent the recurrence of their former condition.

The Treatment of Varicose Ulcers with Acetyl-Beta-Methylcholine Chloride Iontophoresis

Patient	Age in Years, Sex	Duration of Ulcer	Size of Ulcer	Duration of Treatment	No. of Treatments	Result
1. N. S.	55 ♂	12 years	1.8 by 1.7 cm.	6 weeks	18	Healed
2. B. K.	62 ♀	37 years	2 ulcers of 2 cm. diameter	6 weeks	16	Healed
3. M. A.	25 ♀	8 years	2.5 cm. diameter	16 weeks	60	Healed (reopened)
4. N. A.	75 ♀	20 years	4.5 by 5 cm.	3 weeks	13	Healed
5. U.	62 ♀	25 years	7 by 5 cm.	9 weeks	50	Healed
6. S. R.	47 ♀	7 years	2.5 cm. diameter	16 weeks	16	Healed (5 treatments)
7. C.	50 ♀	23 years	11 by 6 cm.	6 weeks	16	Healed
8. J.	51 ♂	7 months	2 cm. diameter	5 weeks	13	Healed
9. B. C.	58 ♂	1 year	Left: 5.7 by 4.6 cm.; right: 7 by 4.1 cm.	8 weeks	22	Healed (13 treatments)
10. S. G.	57 ♀	10 years	3.5 by 0.5 cm. 3 by 4 cm.	10 days	7	Healed
11. E. N.	23 ♂	12 years	4.5 by 1.5 cm.	10 days	4	Healed
12. F. R.	49 ♀	3 years	3.5 by 2 cm. 1.5 by 1 cm.	12 days	5	Healed
13. E. D.	55 ♀	7 years	4.5 by 2 cm.	11 days	5	Healed
14. S. L.	30 ♂	4.5 years	1.25 by 0.75 cm.	3 weeks	12	Healed
15. T. R.	57 ♀	25 years	1 by 1 cm.	8 weeks	24	Healed
16. A. V.	59 ♂	3 years	2.5 cm. diameter	2 weeks	5	Healed
17. U. H.	63 ♀	2 years	5.5 by 8 cm.	20 weeks	100	Healed
18. C. S.	48 ♀	20 years	11.5 by 3 cm.	16 weeks	47	Healed
19. C. A.	51 ♀	3 months	1.75 cm. diameter	1 week	5	Healed
20. R. F.	54 ♂	2 years	2.3 by 3.1 cm.	12 weeks	38	Healed
21. B. G.	36 ♀	3 years	1.6 by 1.2 cm.	6 weeks	24	Healed
22. B. G.	57 ♂	6 years	5 by 2.5 cm.	1 week	4	Unimproved; stopped
23. T. S.	51 ♀	1 year	0.5 cm. diameter	6 weeks	11	Healed
24. S. E.	31 ♂	4 years	L. calf, 2.5 cm. diameter, ankle, 4.3 by 2.6 cm.	12 weeks	39	Not improved
25. G. S.	52 ♂	10 years	1.8 by 0.7 cm.	2 weeks	10	Healed
26. O. C.	63 ♂	1 week	2 ulcers of 0.5 cm. diameter	2 weeks	9	Healed

When one considers the duration of these ulcers preceding treatment and the fact that the patients were neither put to bed nor given any other form of treatment, the results are encouraging, and the method warrants further study and clinical use.

115 East Sixty-First Street.

TULAREMIC PNEUMONIA

LEROY H. SLOAN, M.D.
A. S. FREEDBERG, M.D.
AND
J. C. EHRLICH, M.D.
CHICAGO

Tularemia is a relatively newly described disease in medical literature. First described in ground squirrels by McCoy and Chapin [1] in 1912, it was recognized as a disease of man by Francis [2] in 1922. Since the time of its discovery it has been considered a septicemia and has been recognized clinically in this form.

In 1924 Verbrycke [3] first made mention of a pneumonic process specific for this disease in the report of a fatal case with necropsy. Examination of the lung revealed hard, irregular, discrete nodules in the lower lobe of the left lung, and microscopic study showed principally caseation necrosis. The pneumonia with consolidation was not determined clinically, however, and no mention is made of any relationship between these lesions and the disease itself. In 1925 Francis,[4] in a comprehensive report on tularemia, made no mention of a complicating pneumonia. In a clinicopathologic study Simpson [5] reported one case of a fulminant tularemic bacteremia with necrotizing nodules in the lungs. In the same year Bardon and Berdez [6] reported another case with necropsy which revealed a caseous pneumonia very similar, as they remarked, to tuberculosis. Bunker and Smith [7] reported four similar cases, in one of which Bacterium tularense was recovered from the sputum before death. As far as we are able to determine, this is the only report in the literature in which B. tularense has been found in the sputum.

The first mention of tularemic pneumonia as a clinical entity appeared in 1931, when three separate reports appeared in the literature. Blackford [8] suggested that the so-called clinical bronchopneumonias seen in patients suffering from tularemia were probably the result of tularemic pulmonary lesions. In a study of thirteen cases he found six presenting involvement of the lungs, one of which was examined post mortem and showed tularemic abscess cavities in both lungs. Permar and Maclachlan's [9] patient developed an atypical pneumonia clinically, which at autopsy was found to have been caused by large areas of caseation necrosis in both lungs. They called attention to the grave prognosis associated with such lesions. The pathologic changes were characterized by interstitial and alveolar necrosis apparently due to arteriolar and venous thrombosis. The exudate was described as being chiefly a mononuclear one in the alveoli, and they noted a large

From the Medical Service of Dr. LeRoy H. Sloan, Cook County Hospital.

1. McCoy, G. W., and Chapin, C. W.: Further Observations of the Plague-like Disease with Report of B. Tularense, J. Infect. Dis. **10:** 61, 1912.
2. Francis, Edward: Tularemia, a New Disease in Man, J. A. M. A. **78:** 1015 (April 8) 1922.
3. Verbrycke, J. R.: Tularemia J. A. M. A. **82:** 1577 (May 17) 1924.
4. Francis, Edward: Tularemia, J. A. M. A. **84:** 1243 (April 25) 1925.
5. Simpson, W. M.: Tularemia with Postmortem, Ann. Int. Med. **1:** 1007 (June) 1928.
6. Bardon, Richard, and Berdez, George: Tularemia: Report of a Fatal Case with Postmortem Observations, J. A. M. A. **90:** 1369 (April 28) 1928.
7. Bunker, C. W. O., and Smith, E. E.: Tularemia, U. S. Nav. M. Bull. **26:** 901 (Oct.) 1928.
8. Blackford, S. D.: Pulmonary Lesions in Human Tularemia, Ann. Int. Med. **5:** 1421 (May) 1932.
9. Permar, H. H., and Maclachlan, W. W. G.: Tularemic Pneumonia, Ann. Int. Med. **5:** 687 (Dec.) 1931.

collection of plasma cells in the interstices. Sante [10] reported a case of tularemia in which the patient developed a persistent nonproductive cough. X-ray examination of the chest revealed an irregular consolidation in one lung. The patient slowly recovered and subsequent roentgenograms of the chest were negative. The fact that it required months for the chest to clear makes it highly suggestive that this was tularemic pneumonia, as we shall later point out. Tureen [11] reported a case in which there were pulmonary involvement and an accompanying pleural effusion; the patient recovered, although convalescence was protracted and a thickened pleura was a residue.

Gudger's [12] patient died and necropsy revealed a massive pleural effusion accompanied by pulmonary caseation necrosis; no organisms were found in the lung, but culture from the spleen of an inoculated guinea-pig gave a fruitful growth of B. tularense. Gudger considered tularemia of the lungs a highly fatal disease and mentioned Tureen's [11] report of tularemic pneumonia with recovery as being the only one in the literature up to that time, although Sante's case also seems to fall into this group. Gundry and Warner [13] mention pulmonary lesions as a definite component of tularemia and report one case with necropsy. Blackford [14] insisted that pleuropulmonary infections were frequent in patients who recovered. Archer, Blackford and Wissler,[15] in an x-ray study, pointed out that the diagnosis could not be made by this means alone. Kavanaugh,[16] in a review of 123 cases, found six with pleurisy, three with pleural effusions, and one with pneumothorax, the first mention of this complication in the literature. In his case it was associated with a fatal outcome. Bernstein,[17] in an excellent review of the literature to date, summarizes the twenty-one recorded necropsies, two of which were unsatisfactory or incomplete as far as examination of the lungs was concerned. Of the remaining nineteen, sixteen had pulmonary disease consisting chiefly of caseation necrosis.

Fig. 1.—Area of opacity in middle third of right lung, Dec. 5, 1935.

From what has been said, it seems obvious that tularemia may involve the lungs with a frequency that makes it not at all uncommon. Because of the fact that it is generally regarded as a highly fatal disease, it occurred to us that report of a case with recovery was indicated.

10. Sante, L. R.: Pulmonary Infection in Tularemia: Case Report. Am. J. Roentgenol. **25:** 241 (Feb.) 1931.
11. Tureen, L. L.: Tularemic Pneumonia, J. A. M. A. **99:** 1501 (Oct. 29) 1932.
12. Gudger, J. R.: Tularemic Pneumonia, J. A. M. A. **101:** 1148 (Oct. 7) 1933.
13. Gundry, L. P., and Warner, C. G.: Fatal Tularemia, Ann. Int. Med. **7:** 837 (Jan.) 1934.
14. Blackford, S. D.: Pulmonary Manifestations in Human Tularemia, J. A. M. A. **104:** 891 (March 16) 1935.
15. Archer, V. W.; Blackford, S. D., and Wissler, J. E.: Pulmonary Manifestations in Human Tularemia, J. A. M. A. **104:** 895 (March 16) 1935.
16. Kavanaugh, C. N.: Tularemia: Consideration of 123 Cases with Observations at Autopsy in One, Arch. Int. Med. **55:** 61 (Jan.) 1935.
17. Bernstein, Alan: Tularemia, Report of Three Fatal Cases with Autopsies, Arch. Int. Med. **56:** 1117 (Dec.) 1935.

REPORT OF CASE

First Admission.—P. M., a white man, aged 47, a laborer, born in Italy and residing in the United States for the past twenty-five years, was admitted to the medical service of one of us (L. H. S.) in the Cook County Hospital, Nov. 25, 1935, complaining of headache, cough, and chills and fever for one week. He stated that his illness was ushered in by a severe chill, followed by a high fever and a drenching sweat. He noted severe headache, which became progressively worse, and a cough, which was productive of a thick, yellow sputum. There had been no hemoptysis. All these symptoms had persisted unabated until the day of admission. He had had most of the usual childhood diseases, gonorrhea twenty-five years before, and an inguinal herniorrhaphy fifteen years before. His wife had had two spontaneous abortions, but nine children were living and well.

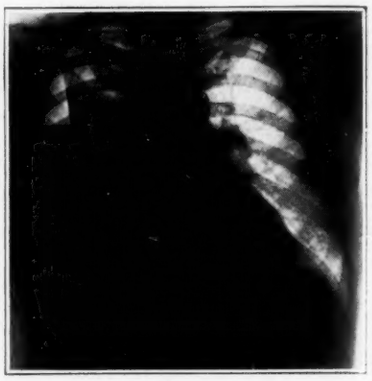

Fig. 2.—Massive effusion in right pleural cavity, Jan. 16, 1936.

On admission the temperature was 103 F., the pulse 110 and the respiration rate 24. The lips and nails were faintly cyanotic. The pupils reacted well to light and in accommodation, and the eyes were otherwise normal. Examination of the throat was negative and there was no cervical adenopathy. The heart and lungs showed no abnormalities. Aside from a soft spleen, which was palpable one fingerbreadth below the left costal margin, examination of the abdomen revealed nothing of importance. The extremities were essentially normal, and the reflexes were physiologic. It is noteworthy that no cutaneous lesion of any kind was present and no adenopathy.

Because of evident sepsis, further inquiry was made and a history obtained of the patient's having skinned a wild rabbit about two weeks before the onset of his illness. A tentative diagnosis of tularemia was then made.

The temperature remained elevated, the pulse relatively slow, and the following day the patient complained of severe sticking pain on the anterior surface of the upper portion of the right side of the chest, aggravated by coughing and breathing. Examination of the lungs was again negative; pain continued and four days later dulness, tubular breathing, bronchophony and fine moist râles were discovered over the anterior surface of the upper third of the right lung. Roentgenograms at this time revealed an area of opacity in the middle third of the right lung extending out from the hilus (fig. 1). Four days later, December 9, another roentgenogram showed extension of this process laterally. Ten days after admission the temperature became normal by lysis and remained so, although physical and x-ray signs of pulmonary consolidation persisted.

A blood count at the time of admission showed 4,500,000 red blood cells, 85 per cent hemoglobin (Tallqvist) and 8,400 white cells, with a differential count of 70 per cent polymorphonuclear leukocytes, 24 per cent lymphocytes, 5 per cent large mononuclears and 1 per cent eosinophils. Repeated urinalyses were negative. The blood culture was negative on two occasions, as were serum agglutination tests for typhoid and the melitensis, porcine and bovine strains of Brucella. The blood Wassermann reaction was negative and repeated stool examinations and cultures revealed nothing unusual. Examination of the sputum showed many mixed nonspecific organisms. Agglutination for B. tularense was positive 1:160 November 25, 1:640 December 3 and 1:640 December 13.

December 19 the patient was discharged with the diagnosis of tularemic pneumonia, unresolved. X-ray examination at this time still showed considerable density in the region of the right hilus.

Second Admission.—Jan. 15, 1936, the patient was readmitted. During the interim he had been complaining of dull pain in the right side of the chest associated with some dyspnea. For three days prior to this admission he had been coughing a good deal

and had been expectorating about one cupful of thick yellow sputum daily. Physical examination at this time revealed diminished expansion of the right lung, and flatness over the right side of the chest posteriorly from the level of the fifth thoracic vertebra down. Tactile fremitus, breath sounds and voice sounds were totally absent over this area. X-ray examination at this time demonstrated a massive effusion in the right pleural cavity with evidence of slight pneumothorax (fig. 2).

Thoracentesis yielded 200 cc. of a slightly clouded amber fluid. Stained smears revealed no organisms and a predominance of lymphocytes. Agglutination tests on the fluid for B. tularense were positive 1:512. Serial roentgenograms demonstrated progressively decreasing amounts of fluid in the pleural cavity accompanied by an increased amount of air, and marked thickening of the pleura. Repeated sputum examinations were negative for tubercle bacilli. Cultures of the fluid revealed nothing, nor did inoculation into a guinea-pig. Further agglutination tests for B. tularense on the blood and pleural fluid were increasingly positive up to 1:1,280. Eight days after admission, while bending over, the patient had a violent coughing spell and expectorated about 4 ounces (120 cc.) of a thin yellow fluid. Increased cough and expectoration continued for about ten days, during which roentgenograms revealed extensive hydropneumothorax with 80 per cent collapse of the lung (fig. 3). A bronchial fistula was suspected. February 18 the patient left the hospital with diminished cough and expectoration and a right hydropneumothorax, with about 60 per cent collapse of the lung.

Examination, March 5, revealed dulness over the right side of the chest posteriorly with distant breath sounds and no râles. There was hyperresonance anteriorly and a positive coin test was elicited. A roentgenogram showed a 60 per cent pneumothorax and a markedly thickened pleura (fig. 4). The patient's clinical condition was good.

The final diagnosis was tularemia with pneumonia complicating persistent hydropneumothorax, and chronic pleuritis.

COMMENT

From the reports in the literature, particularly in the light of recent pathologic studies, we are led to believe that tularemic pneumonia is not a rare disease, although it is often unrecognized. While only one instance of recovery of the organism from the sputum has been recorded [7] and while an absolute clinical diagnosis is difficult in the absence of this finding, the frequent association of caseous pneumonia with tularemia makes it reasonable to assume that an atypical pneumonia developing in a patient with a clinical history of tularemia, particularly if associated with pleural effusion, combined with a protracted course, and the failure to establish tuberculosis or other specific granulomas as the etiology, is sufficient evidence to establish the clinical diagnosis of tularemic pneumonia. It is noteworthy that, in all the reported cases, as in Sante's,[10] Kavanaugh's [16] and ours, the physical and x-ray signs of pulmonary consolidation do not appear until quite late in the course of the disease and do not disappear until long after apparent clinical recovery, if at all.

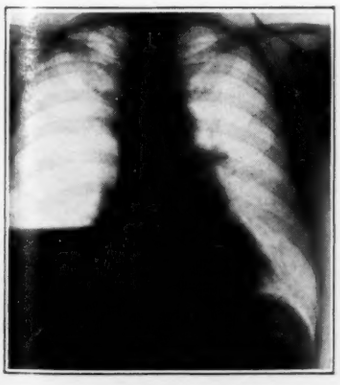

Fig. 3.—Hydropneumothorax, Jan. 21, 1936.

The process evidently begins with involvement of the hilus, which then spreads peripherally, making early diagnosis difficult.

The prognosis is generally considered to be very unfavorable, but reports of tularemic pneumonia with recovery, together with the fact that many cases are probably unrecognized, throw some doubt on this conclusion.

With regard to pathogenesis, tularemia is usually associated with an obvious cutaneous lesion which is considered the portal of entry, although Francis [18] and Simpson [5] have shown that the organism may pass through the unbroken skin, although these cases are usually associated with regional adenopathy. It seems reasonable that in so-called typhoidal or cryptogenic tularemia, in which there is neither an ulcer nor adenopathy, the portal of entry may be other than the skin in some instances, as in the respiratory or gastro-intestinal tracts.[19] In our case, for example, the onset of productive cough shortly following the constitutional symptoms, together with the absence of a cutaneous lesion, may be interpreted as being due to a primary tularemic pneumonia. The absence of physical changes may be explained by the presence of localized hilar involvement.

Fig. 4.—Pneumothorax and thickened pleura, March 5, 1936.

CONCLUSIONS

1. A case of tularemic pneumonia with recovery was complicated by a spontaneous hydropneumothorax.

2. The late onset, the lobular distribution and the prolonged course are the outstanding clinical manifestations.

3. No effective specific treatment is known; in our patient supportive and palliative measures resulted in recovery.

55 East Washington Street.

18. Francis, Edward, and Lake, G. C.: Tularemia, Pub. Health Rep. **37:** 392 (Feb. 24) 1922.
19. Beck, H. G., and Merkel, W. C.: Tularemia: Fatal Case of the Typhoid Form, Caused by Ingestion of Rabbit, with Autopsy Report, South. M. J. **28:** 422 (May) 1935. Amoss, H. L., and Sprunt, D. H.: Tularemia, J. A. M. A. **106:** 1078 (March 28) 1936.

Clinical Investigation in the "Florid Twenties."—Keeping pace with the spirit of abandon which characterized the florid twenties, clinical investigation ran riot, recognizing no bounds, philosophical, intellectual, technical or financial. With apparently unlimited financial resources, the business man's concept of mass production tended to creep into academic medical circles without due appreciation of the differences in the aims of business and of science. Under this spell of enthusiasm it seemed reasonable to expect that with organized groups of investigators, spacious laboratories, endless equipment and technical assistance, the mysteries of medical science must bow before the concerted onslaught and bow promptly. Medical students and young graduates, without consideration of "Geist" or other qualifications, were urged to enter laboratories. The sobering effect of the economic crash upon industrial and financial structures has had far-reaching repercussions and has been seriously felt in most of the clinics of this country. The problem of curtailment and economy has involved all those interested in clinical investigation and we are now confronted with the inevitable and healthy task of taking account of stock and separating the wheat from the chaff. In other words, we must decide what, out of this great orgy of clinical investigation, is most worthy of salvage.—Loeb, Robert F.: Comments on Clinical Investigation, *Science* **83**:423 (May 8) 1936.

TUBERCULOSIS OF THE CLAVICLE

REVIEW OF THE LITERATURE AND REPORT OF A CASE

JACOB SIRKIN, M.D.
AND
E. A. BAUMGARTNER, M.D.
NEWARK, N. Y.

Tuberculosis of the clavicle has rarely been reported. We have been closely observing such a case in the past year and have made a rather careful search of the cases reported. Recently Macey [1] at the Mayo Clinic briefly reported a case of tuberculosis of the left clavicle and right malar bone, both of which are infrequently seen; Coley [2] reported a case about forty years ago. We have seen no other American reports. There have been twenty-one cases reported in the French literature that we have seen. Couillard-Labonette [3] in 1898 gave a review of the literature in which he stated that LeDentu,[4] Reverdin [5] and Thierry [6] had reported cases.

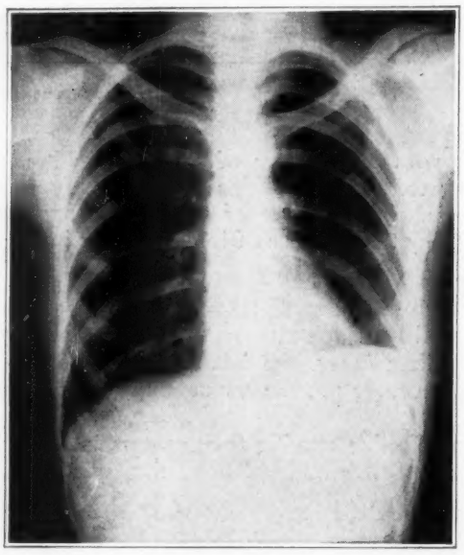

Fig. 1.—View of chest.

We have included these cases in our report. Couillard also added three new cases of his own. Conor [7] reviewed the literature and, besides quoting the cases cited by Couillard, made reference to a case reported by Bakardjieff.[8] This, too, has been included in our report. Conor added one new case. Besides these we have found one case described in the German [9] literature and one in the Scandinavian.[10]

Since so few cases have been reported, we have tabulated those found in the literature since 1882, the date of the discovery of the tubercle bacillus by Koch. In the table we have given the pertinent data concerning the cases.

From the Newark State School.

1. Macey, H. B.: Tuberculosis of the Clavicle and Malar Bone, Proc. Staff Meet., Mayo Clin. **10:** 289 (May 8) 1935.
2. Coley, W. B.: Tubercular Osteitis of the Clavicle Simulating Malignant Disease; Operation; Recovery, New York M. J. **54:** 230, 1891.
3. Couillard-Labonette, J. M.: Contribution à l'étude de la tuberculose de la clavicule et de ses articulations, Fac. de méd. et de pharm. de Bordeaux **61,** 1898.
4. Le Dentu: Soc. de chir., 1882.
5. Reverdin: Rev. méd. de la Suisse Rom., 1886.
6. Thierry: Thèse de Paris, 1890.
7. Conor, A.: Tuberculose de la clavicule, Gaz. d. hôp., Paris **77:** 1021, 1904.
8. Bakardjieff: Thèse de Montpellier, 1902.
9. Schaefer, H.: Ueber das Auftreten von Erweichungsherden in Schlüsselbeinkopf, Chirurg. **2:** 71, 1930.
10. Huitfeldt: Tuberkulosis claviculae, behandlet med resektion og fri benplastik fra ribben, Forh. Kristiania kir. for., 1912, p. 51.

The table lists thirty cases. Eleven of the patients were females, eighteen were males, and the sex of one was not stated. The ages have varied from 10 to 72, the latter case being the one reported by Macey.[1] Twenty-one of the patients were between the ages of 10 and 40, and eleven of these were between 20 and 29.

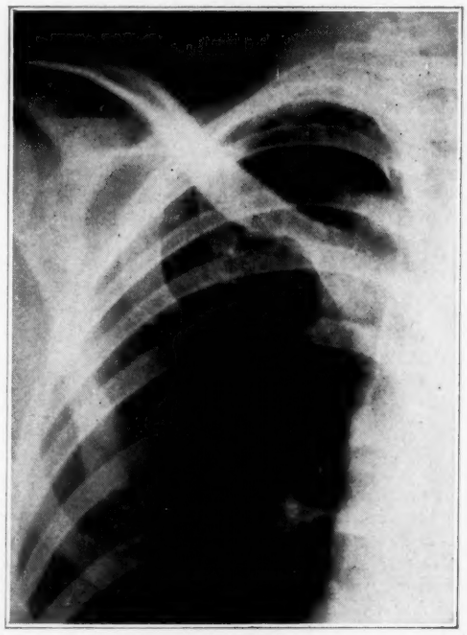

Fig. 2.—Close-up view of right clavicle, showing destructive process.

Of these eleven, eight were males. There were four females between the ages of 10 and 19. The ages of two were not given. In twelve patients the left clavicle was involved and in eleven the right, while the one diseased was not specified in seven cases.

Fig. 3.—View of pelvis, showing sacro-iliac joint involvement.

In fifteen cases, including ours, just half of those here tabulated, we have considered as definite proof that the lesion was tuberculous. In eight of these cases histologic examination was accepted as proof of the case. In two cases material from the lesion injected in a guinea-pig proved the lesion, while in a third this was

used as confirmatory evidence. In two cases x-ray evidence alone was given and accepted, and in three others it was confirmatory to histologic examination or guinea-pig inoculation. Tubercle bacilli were found in the curettings or discharge in two patients and, in our patient, along with x-ray examination and guinea-pig inoculation, proved the case.

Eighteen patients were treated by excision or resection of the diseased bone, and in ten patients curetting only was done. In several cases curetting was attempted at first and excision practiced later. One patient refused operation and one, accepted as tuberculous from x-ray evidence only, was treated by rest and sunlight. In twenty-one patients the result was said to be good or the patient said to be cured. The outcome of the treatment is not given in seven cases, while in two, both after resection, a sinus persisted. For the case in which operation was not done the outcome is not given.

There were known tuberculous foci besides the clavicle in eleven cases. Other bones or joints were involved in four cases, the knee, spine, frontal bone, malar bone and sacro-iliac joint. There was a breast abscess, probably tuberculous, in one of these. The lungs were apparently diseased in five cases, with pleurisy in two, bronchitis in one and pulmonary tuberculosis in two. The glands of the neck had been involved, as shown by the history in two cases. Two cases presented renal tuberculosis, as proved by the finding of tubercle bacilli in catheterized specimens. Ozenne [11] is reported as stating that no other foci of tuberculosis were present in his case, while in eighteen no data are given as to other tuberculous lesions.

We have recently had under our care a young woman with a swelling over the clavicle. A needle was inserted because the tumor fluctuated, and a study of the pus showed many tubercle bacilli. The details were as follows:

REPORT OF CASE

The history is rather incomplete owing to the fact that the patient, being mentally defective, cannot give an accurate story of her previous illnesses. Nothing is known of her family except that her parents were mentally defective. She entered the Newark State School in February 1931. She had chicken-pox, measles and mumps as a child; convulsions were present until the establishment of menstruation; she had given birth to two children uneventfully before admission. A diagnosis of mild hyperthyroidism with exophthalmos had been made. She had frequent colds and attacks of tonsillitis. She was ill from August 1932 to January 1933, with a diagnosis of pulmonary tuberculosis, after which time she resumed her usual duties and, apparently, was recovered.

Cases of Tuberculosis of Clavicle

Reference	Date	Sex	Age	Clavicle	Proof	Treatment	Outcome	Other Tuberculous Foci
Jahresb. ü. d. chir. Abt. d. Spit. in Basel, 1884-1885, p. 51	1887	♂	32	Left	.....	Excision	Good	Not given
Gangolphe, M.: Mém. et compt.-rend. Soc. d. sc. méd. de Lyon **30**: 203, 1890	1890	♀	16	Left	.....	Excision	Good	Not given
Petitpierre, M.: Thèse, Fac. d. méd. et de pharm. de Lyon, series 1, no. 530, 1890	1890	♀	34	Right	.....	Curetted	Good	Not given
		♀	38	Right	.....	Curetted	Good	Not given
		♀	22	Left	.....	Curetted	Good	Left knee, abscess right breast
Coley [2]	1891	♂	41	Left	.....	Curetted	Not stated	Spine, right fore-arm, frontal
Ozenne [11]	1898	♀	28	Right	Histologic	Curetted	Good	No other foci
Couillard [3]	1898	..	..					
Le Dentu [4]	1882	♂	55	?	Microscopic	Resection	Cured	Not given
Reverdin [5]	1886	♀	10	?	.....	Curetted	Good	Bronchitis
Thierry [6]	1890	♂	42	?	.....	Resection	Cured	Pulmonary
		♂	55	Right	.....	Resection	Good	Not given
		♀	16	Left	.....	Resection	Sinus persisted	Not given
		♀	19	Right	.....	Resection	Not stated	Not given
Kahn, G.: Thèse, Paris, 1900	1900	♂	29	?	Histologic	Resection	Sinus persisted	Glands in neck as child
		♂	28	Right	Histologic	Resection	Cured	None given
		♂	22	Left	Histologic	Resection	Good	Pleurisy 9 years before
Chopinet, C.: Arch. méd. de Toulouse **7**: 74, 1901	1901	♂	22	Right	.....	Resection	Good	Not given
Conor [7]	1904	♂	13	Left	Guinea-pig inoculation	Resection	Good	Not given
Bakardjieff [8]	1902	♂	22	Left	.....	Resection	Good	Pleurisy
Huitfeldt [10]	1912	♂	29	Left	X-ray, histologic	Resection	Good	Glands of neck
Martin, A.: Arch. gén. de chir. **8**: 796, 1914	1914	♀	59	?	Guinea-pig inoculation	Patient refused operation	Not stated	Not given
		♂	?	?	X-ray	Excision	Good	Not given
		♂	36	Left	Histologic	Resection	Good	Not given
		♂	22	Right	?	Resection	Not stated	Not given
		♂	22	Left	?	Resection	Not stated	Not given
		?	?	?	Tubercle bacilli from curetting	Curetted	Not stated	Not given
Ménard, L.: Paris méd. **1**: 48 (Jan. 8) 1927	1927	♂	47	Right	Tubercle bacilli	Curetted	Not stated	Kidneys
Schaefer [9]	1930	♂	16	Right	X-ray	Sunlight	Cured	Not given
Macey [1]	1935	♀	72	Left	X-ray, histologic	Curetted	Good	Malar
Sirkin and Baumgartner	1936	♀	26	Right	Tubercle bacilli, guinea-pig inoculation, x-ray	Curetted, sun lamp	Healing	Urinary tract, sacro-iliac joint, healed pulmonary

In January 1935 the patient complained of pain in the right hip while walking. Examination revealed no pain on weight bearing, but extreme pain was present on internal rotation and abduction of the thigh. Roentgenograms of the hip at that time revealed nothing remarkable. February 6, the patient complained of dysuria and said that she thought the urine had appeared red at times. Examination of the chest and abdomen was negative, and the right hip was the same as before; there was no tenderness at the costovertebral angles and no edema of the extremities. The blood pressure was 120 systolic, 72 diastolic. A kidney function test was done which showed 52.6 per cent phenolsulfonphthalein excreted in the first hour and 15 per cent excreted in the second hour, for a total of 67.6 per cent, with a total of 730 cc. of urine. A Mosenthal test of voided urine at that time showed specific gravity for the night urine to be 1.015, and the quantity 930 cc. The day urine varied in specific gravity from 1.005 to 1.015, and the total quantity was 620 cc. The reaction of the different specimens of urine was either neutral or alkaline. Albumin was present in quantities from a trace to two plus. No sugar was found. There were pus and epithelial cells present, few bacteria, and no casts. Menstruation apparently had always been irregular. The patient's weight had been stationary at about 105 pounds (47.6 Kg.).

11. Ozenne, M.: Ostéite tuberculeuse suppurée avec séquestre de la diaphyse de la clavicule: Congres pour l'étude de la tuberculose, Bull. méd. **12**: 845, 1898.

Illness.—The patient complained of swelling, May 17, with pain and extreme tenderness, at the junction of the sternum and the right clavicle. She stated that there had been no accident or injury.

The patient had a mongoloid appearance; vision in the left eye was impaired. There was an external strabismus of the left eye. The thyroid was slightly enlarged. The tonsils were small and not infected, and the teeth were in good condition. Abdominal striae were present. The heart, lungs and abdominal organs showed no abnormalities on physical examination. Deep reflexes were exaggerated; no pathologic reflexes were present. No lymph glands were palpable in the neck or axillae, but several small ones were found in the inguinal regions. There was no pain in the region of the hips or pelvis on palpation or manipulation. A pelvic examination showed a second degree retroversion, and the right tube contained several small nodules. The left tube was not remarkable. The area at the junction of the right clavicle and the sternum was slightly swollen and quite tender. No redness was present. On pressure a snap could be felt and the protuberance receded slightly. A tight bandage of orthopedic felt was applied and the swelling receded considerably.

The blood pressure was 120 systolic, 72 diastolic and has remained so since. The Wassermann reaction of the blood was negative. The basal metabolism was +2 per cent.

The patient felt much better and on June 5 the swelling was entirely gone and there was no pain. About ten days later the swelling and tenderness again appeared and the same treatment was instituted. There again appeared to be an improvement, but this was not permanent. Finally on two separate occasions greenish pus was obtained by means of a needle (done under aseptic conditions) which revealed many acid-fast bacilli. Inoculation of guinea-pigs each time culminated in their death from tuberculous lesions in the lungs and other organs, with demonstration of numerous tubercle bacilli in these tissues. A few weeks later the area broke down and a sinus resulted. The blood counts at this time ranged from 5,300 to 7,400 leukocytes, with 75 per cent neutrophils; otherwise the count was essentially normal.

Following this, roentgenograms of the chest and pelvic regions were taken by Dr. L. W. Oehlbeck of Clifton Springs, N. Y., who reported: "The fluoroscopic study of the chest shows an elevated left diaphragm, which shows a marked limitation in excursion. Both diaphragms are sharply outlined and the right apparently shows fairly good movement. From the films it is also apparent that there is pleural thickening at the left apex. The hilus shadow on this side is rather heavy and it is possible that there are small calcified areas present. On the right side the apex is clear, but there is a fair area of increased density noted at the infraclavicular area. There is a fair sized defect noted on the exterior surface of the inner end of the right clavicle. The sternal end of the right clavicle appears irregular in outline as compared with the left. There are no changes present to suggest new bone formation.

"Conclusions: There is evidence of old tuberculosis on the left with pleural thickening and osteomyelitis of the inner end of the right clavicle. While it is possible that the area of increased density in the right infraclavicular area could be caused by increased thickness of the overlying soft tissue, it would seem well to check this area at a near date in the future.

"Destructive process noted in the right sacro-iliac joint, . . . the cartilage has mainly been destroyed, and the lesion as a whole appears destructive in type without proliferative changes. . . . The possibilities are good for the lesion being a tuberculous one. This, of course, particularly in view of the fact that other tuberculous foci are already established."

The roentgenograms are reproduced herewith.

The patient was given ultraviolet treatments daily, but with negligible improvement. The temperature varied from 97.2 to 99.4 F., most of the time being between 98 and 98.6 F. October 2 the patient was operated on by Dr. C. W. Webb of Newark, N. Y., who found the sternoclavicular joint apparently normal but the shaft just adjacent involved. The necrotic area in the clavicle was curetted, and it was noted that the area did not extend into the surrounding tissues. A petrolatum gauze pack was inserted. Boric acid ointment dressings were used and the gauze packing gradually was forced out by the underlying granulation tissue. The temperature varied between 98 and 100 F. until on November 1 it rose to 100.2 F., and she was very uncomfortable in the region of the right kidney. However, the temperature again went down to normal limits for several days, but on November 10 she started to have a temperature of 100.8 F. and by November 13 it began varying from 98.6 to 101.6 F. The blood count on December 4 showed 4,900,000 red cells, hemoglobin 85 per cent (Tallqvist), 20,000 leukocytes, 87 per cent neutrophils, 10 per cent lymphocytes, 2.7 per cent large mononuclears, and 0.3 per cent eosinophils.

Examinations of voided urine showed acid-fast bacilli with many pus and red blood cells. Albumin ranged about two plus. No sugar or casts were found. Ureteral catheterized specimens of urine showed red cells and pus cells in the urine of the right kidney, while the left urine was clear. Blood urea nitrogen examinations varied from 9.0 mg. to 13.3 mg. per hundred cubic centimeters of blood.

She remained about the same with a slight drop in temperature until November 18, at which time the temperature began to vary between 99 and 102 F. and she again felt uncomfortable in the right kidney region. November 20 she showed variations in temperature from 98.6 to 103.2 F. The next day the temperature rose to 104.2 F. and the pulse, which previously had ranged from 90 to 120, rose to 158. During this period she was given phenobarbital and codeine as necessary for her pains and on November 25 cystoscopic examination was done by Dr. W. C. Eikner of Clifton Springs, N. Y., who reported that the cystoscope was readily inserted. The urine was found to be grossly bloody and extremely purulent. From eight to ten irrigations were necessary before a clear medium could be obtained. The bladder capacity was estimated at around 250 cc. Inspection of the bladder revealed a rather interesting picture. Surrounding the region of the right ureteral orifice a hopeless conglomerate ulcerative lesion was seen, which seemed to extend over the trigon and was confluent with rather heavy ulcerative and inflammatory processes across the fundus of the bladder. Some areas on both lateral walls were less involved and appeared to be only chronically inflamed. The greater portion of the bladder mucosa, however, was extremely red and either ulcerative or preulcerative in type. Much less of the retraction was seen surrounding the left ureteral orifice than that of the right. The right ureteral orifice was never distinctly seen and retraction was evident as from a chronically infected ureter pulling it upward. Clear spurts of urine were seen from the region of the left. The catheter was readily advanced up the left ureter to the pelvis, with no obstruction being met. It was impossible to engage the catheter in the right ureter. Fairly clear urine was obtained from the left, though drops came irregularly. Indigo carmine was then given intravenously and after seven minutes was seen coming faintly from the left and after ten minutes very strongly. At no time was any seen to come from where the right ureteral orifice should be. Observation was extended for approximately seventeen minutes.

December 9 a right nephrectomy was performed by Dr. John C. Carmer of Lyons, N. Y. The kidney was filled with green pus and microscopically showed evidence of tuberculosis. Since that time the patient has been receiving cod liver oil and ultraviolet treatments to the whole body daily. The operated area at the clavicle is still draining slightly but is slowly healing, as is the nephrectomy incision. The patient feels very much better, and the temperature has been normal for several weeks. The pulse ranges around 85 and the white blood count varies between 6,000 and 7,000, with about 65 per cent neutrophils. Her weight, which dropped to 85 pounds (38.6 Kg.) at the time of the nephrectomy, has risen to 94 pounds (42.6 Kg.). A guinea-pig, injected with bladder urine seven weeks ago, is gaining weight. The urine is clear, has contained one plus albumin or less, and has contained red cells and white blood cells microscopically. Pelvic examination at present shows no nodules in the right tube. There are no symptoms or signs that show evidence of sacro-iliac disease at present.

At present (June 10, 1936) the patient weighs 108 pounds (49 Kg.) and is up and about. The area at the clavicle has completely healed and the area at the nephrectomy incision has almost healed. The latest urine report shows no red cells, a few pus cells and a trace of albumin, which is an improvement over the previous urinalysis. The last guinea-pig inoculated with the patient's urine was released after nine weeks as not infected with tuberculosis.

COMMENT

Tuberculosis of the clavicle apparently occurs quite infrequently. The older surgeons saw occasional cases of necrosis of the clavicle; these were called syphilis, tuberculosis or cancer. In a review of the literature since 1882 we have found fourteen papers dealing with twenty-five cases of this disease, and in these references were made to four other cases which, with the one we describe, make thirty cases. Age appears to be an important factor, as most of these patients were between 10 and 40 years of age, ten of them between 10 and 20 and only four more than 50 years of age. Sex apparently has little influence, since the disease is about equally frequent in the two sexes. There is no apparent predilection for either clavicle. Some writers have divided the disease according to the part of the bone involved. It would seem that this is not necessary. The question in a few of the reported cases was whether the sternoclavicular joint or the clavicle was the site of the disease. The cases here reported are those showing tuberculosis of the shaft of the clavicle. In our patient it was a question at first as to the joint involvement, but operation showed the joint surfaces normal and the disease in the clavicle. We believe that it was diaphyseal in origin, but in late stages it is difficult or impossible to say that the epiphyses were not involved first.

It is claimed by some that the only method of treatment is by excision. Certainly in some cases curetting appears to have been sufficient for a cure. However, also in some cases curettage has had to be repeated because of a persistent sinus. In two cases reported as treated by resection, sinuses developed and drained a long time. The important point appears to be the complete removal of the diseased portion of the bone. Certainly it is proved that there is no special handicap in complete removal of the diseased clavicle for, if the periosteum is not destroyed, new bone develops. Bone transplantation has been done successfully.

The question of a primary focus in the clavicle vexes here as in other bone tuberculosis. Though infrequently described, there appears to be no anatomic or pathologic reason why primary clavicle involvement cannot occur. Trauma was associated with several of the cases reported; it was definitely not associated in some. Other foci of tuberculosis are described in eleven cases, involving other bones in four cases, while the lungs, glands of the neck, kidneys and breast were tuberculous in others. Our patient had tuberculosis of a kidney and this has been successfully removed, with recovery of the patient continuing to this time. Another unusual tuberculous involvement in our patient is the sacro-iliac joint, as is evidenced by the x-ray examination.

CONCLUSION

A patient developing a tumor over the right clavicle was found to have tuberculosis of the clavicle. Apparently developing later, at least with symptoms occurring after this, the right kidney was involved and removed. X-ray examination showed a lesion diagnosed tuberculosis of the sacro-iliac joint by the roentgenologist. The diseased clavicle was curetted and is now healing. Tubercle bacilli were found in the pus removed by needle from the clavicular tumor and injected into guinea-pigs, which developed the typical lesions.

Twenty-nine cases of tuberculosis of the clavicle described in the literature showed that this disease occurs in the young adult of either sex and that thorough curetting or excision cures the condition. In one case sunlight, with no other treatment, also apparently effected a cure.

529 Church Street.

CULTURE OF HUMAN BONE MARROW

A SIMPLE METHOD FOR MULTIPLE CULTURES

EDWIN E. OSGOOD, M.D.
AND
INEZ E. BROWNLEE, B.A.,
PORTLAND, ORE.

In a preliminary report on the culture of human bone marrow [1] a number of problems were outlined for solution. It is our purpose in this note to report progress on problem 4, "development of improvements in the apparatus and of simplified apparatus for multiple short experiments." The original apparatus duplicates as nearly as possible conditions within the body but is so complex that large numbers of experiments could be carried out only at great expense. The method described here, while not duplicating body conditions so exactly, permits satisfactory growth of marrow and is convenient for growing a large number of cultures at the same time.

The method consists in the use of vials with rubber vaccine caps. The type in which sterile 50 per cent dextrose solution is ordinarily dispensed is most satisfactory, especially those with the vaccine caps on each end. The procedure is as follows:

Sterilize the vials in the autoclave or by boiling and, using aseptic technic, introduce into the vials with a sterile syringe and needle the desired amounts of culture medium. Perform a sternal puncture or remove aseptically part of another culture and introduce this material with a syringe and a 20 to 22 gage needle into as many vials as desired. Aspirate filtered gas mixture of any desired composition into the syringe and introduce a needle through the top of the vaccine cap to permit the air to escape from the vial. Force this gas mixture through the lower cap, bubbling it through the medium until it is equilibrated. Then remove both needles and place the vials in an ordinary 37.5 C. incubator or water bath. To withdraw the culture for examination, simply mix thoroughly by shaking and aspirate with a sterile syringe and needle. To change the medium,[2] allow the culture to settle or centrifugate [3] and introduce a needle through the bottom vaccine cap until the point is just above the level of the cells. Withdraw the medium and in a similar way introduce the desired amount of fresh medium.

By the use of this vaccine vial technic it has been possible to make rapid strides in the study of the effects of variation in the composition of the medium, and cultures showing many mitotic figures are now readily obtained. Its disadvantage is that the composition of the medium and that of the gas mixture are not held constant as they are in the original apparatus. The advantages of this technic are its simplicity, the ease of making transfers, and its adaptability to running a large series of cultures differing in only one factor.

Aided by a grant from Eli Lilly & Co., Indianapolis.
From the Department of Medicine, University of Oregon Medical School.

1. Osgood, E. E., and Muscovitz, B. S.: Culture of Human Bone Marrow: Preliminary Report, J. A. M. A. **106**: 1888 (May 30) 1936.

2. It seems possible that with the type of vial with one cap kept in a water bath, a continuous gas flow or a steady flow of medium previously equilibrated with the desired gas mixture could be introduced through a long needle and allowed to flow out through a short needle slowly enough not to disturb the cells.

3. This type of vaccine vial will fit in the metal tubes of the size used for 100 cc. centrifuge tubes and so can be centrifugated if for any reason removal of the medium is desired shortly after the cells have been mixed.

Clinical Notes, Suggestions and New Instruments

A SIMPLE AND INEXPENSIVE METHOD OF MAKING LANTERN SLIDES OF SKETCHES AND TYPED MATERIAL

SAMUEL J. LEVIN, M.D., DETROIT

The use of lantern slides showing tables, classifications and sketches, during scientific presentations, lends much to the clarity of a paper and has had an increasing vogue. The following method was worked out to obviate the expense of the photographic method of making such lantern slides:

A sheet of cellophane, the size of a standard lantern slide, is placed between two sheets of heavy carbon paper, the carbon side toward the cellophane. These are then placed between two sheets of thin white paper, folded into an envelope of the same size. The material to appear on the slide is typed in the usual manner, a three-fourths inch blank border being left. A clear carbon copy is thus produced on the cellophane, which is then removed and mounted between two lantern slide coverslips, the edges being taped with standard lantern slide binding tape.

Free-hand sketches can be made directly on the cellophane with india ink by means of a fine pen-point. Diagrams of apparatus can be traced in the same fashion. The india ink dries rapidly, after which the sheet of cellophane can be mounted as described.

One of the chief advantages of this method, aside from the considerable saving involved, is the fact that the images projected on the screen from these slides are much larger than those from lantern slides made by photographic reduction. The amount of material that can be typed on the sheet of cellophane is necessarily limited. This may make it necessary to break up large tables into a number of smaller ones, but the resulting images can be seen even in the rear of large lecture rooms.

2501 West Grand Boulevard.

SEVERE GASTRIC HEMORRHAGE PRODUCED BY VIOLENT ABDOMINAL MASSAGE

WALTER C. ALVAREZ, M.D., ROCHESTER, MINN.

It is fairly well known that severe exertion involving the abdominal muscles can produce hematemesis in patients with peptic ulcer. I can remember a number of such cases. In one instance a traveling salesman, with a big trunk on the back of his car, was lying on his stomach struggling to jack up a rear wheel when suddenly his mouth filled with blood. That a man can put great shearing strain on the movable parts of the bowel that adjoin fixed ones is shown by the recorded cases in which a man, perhaps standing on a chair with his hands above his head putting up a picture, slipped and, in trying to save himself, contracted the muscles of the anterior abdominal wall and tore the duodenum or the first few inches of jejunum so badly that prompt surgical intervention was necessary.

The case here reported is that of a man, aged 31, who has suffered with pains of duodenal ulcer off and on since he was 11. A while ago he placed himself in the care of an irregular practitioner, who put a large electrode on the lower part of the patient's abdomen and sent through him a strong, rhythmically interrupted current which caused all the abdominal muscles to contract vigorously several times a minute. In a few minutes he began to be greatly distressed, and shortly afterward, before he could call the man back to the booth to shut off the current, he began to vomit such large quantities of blood that he became almost exsanguinated and had to have several transfusions. He never showed any other tendency to bleed in the twenty years in which he has had the ulcer.

Certainly it would appear that vigorous massage of the abdomen is not a good treatment for peptic ulcer. In fact, bending over and contracting the abdominal muscles are two maneuvers so hard on many patients with ulcer that one wonders how a laborer with the disease can ever get well. It is hard enough sometimes for a man with ulcer to stay well when he can sit at a desk all day.

From the Division of Medicine, the Mayo Clinic.

Special Clinical Article

THE BONE MARROW

CLINICAL LECTURE AT KANSAS CITY SESSION

R. H. JAFFÉ, M.D.
CHICAGO

The improvement in the technic of biopsies of the bone marrow has added a valuable method to the diagnostic laboratory procedures to which the clinician can resort in the cases in which the examination of the peripheral blood fails to give definite information. The importance of the examination of the bone marrow in vivo becomes evident if one considers the fact that the circulating blood does not always reflect the condition of the bone marrow. Great differences exist sometimes between the cellular content of the blood and that of the bone marrow which may be the source of diagnostic errors. Since the biopsy of the bone marrow is expected to become widely used in clinical medicine, I shall present a brief discussion of the normal bone marrow and of the changes that are observed in some of the important disturbances of blood formation.

THE NORMAL BONE MARROW

In early childhood active, red marrow fills the cavities of all the bones. By the age of 7 years, fat cells start to appear between the cells of blood formation, and with progressing age the active marrow gradually recedes from the distal portions of the skeleton toward the trunk. Its place is taken by an adipose tissue that is somewhat different from the adipose tissue in other locations. Thus its iodine number is different and it contains more cholesterol esters than the other fat deposits of the body. In the adult, the active red marrow is confined to the flat and short bones and to the proximal portions of the humerus and femur (Neumann,[1] Hedinger,[2] Askanazy,[3] Piney,[4] Turnbull[5]). In the phalanges of the fingers and the toes the bone marrow is rich in connective tissue fibers.

The weight of the bone marrow amounts to from 3.4 to 5.9 per cent of the body weight[6] and there are five ninths of a gram of marrow to one gram of blood. Approximately half of the bone marrow of the adult individual is in an active state (red marrow) while the other half consists of fat tissue (yellow or adipose marrow). The red marrow, therefore, equals in weight

From the Department of Pathology of the Cook County Hospital and the Uihlein Memorial Research Laboratory of the Grant Hospital.

Read in the General Scientific Meetings at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 12, 1936.

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the liver. In advanced age or in wasting diseases the fat may disappear from the marrow to become replaced by a semiliquid, gray and translucent material (gelatinous marrow). In dystrophic and malacic diseases of the bone and in chronic inflammation, the bone marrow changes into fibrillar connective tissue (fibrous marrow).

The fat tissue of the bone marrow is in a very labile state.[7] When the demand for new blood cells rises above the normal level, new areas of blood formation are quickly formed and the active marrow expands in a centrifugal direction toward the distal parts of the long bones. The small islands of red marrow in the proximal portions of the humerus and femur enlarge and fuse together, and foci of active marrow, which are located about dilated blood capillaries, appear in the midst of the fat tissue. An excessive demand for blood cells may call for a widening of the bone marrow spaces, which is accomplished by the resorption of the bony trabeculae that cross the marrow cavities and eventually also by the resorption of the inner layer of the cortical bone.

Microscopically the red marrow consists of a cellular reticulum the meshes of which are filled with the precursors of the cells of the circulating blood. This cellular reticulum is anchored to the endosteum that covers the inner surfaces of the bone. It forms also the lining of the sinusoidal blood spaces, into which the mature blood cells are discharged and which connect the terminal branches of the arteries with the veins. In addition to the sinusoids, in which the blood is circulating very slowly, there are fine capillaries, which are usually closed to the circulation. I believe that all the cells of the bone marrow are derived from a common parental cell, which breaks loose from the cellular reticulum and drops off into the spaces between the branched and anastomosing reticulum cells. In the case of erythropoiesis the mobilized, undifferentiated cell, which has been called the hemocytoblast, develops into a large cell with a deeply basophilic cytoplasm and a round nucleus that contains a fine and dense chromatin net (the erythrogonia). In succeeding generations the cells decrease in size, the chromatin arranges itself in the form of coarse clumps, and in the cytoplasm hemoglobin appears, which causes the cytoplasm to become first amphophilic (polychromatic) and later acidophilic (orthochromatic). Approaching maturity the nucleus shrinks to a small, deeply stained clump, which is finally expelled, and the cell is ready to start on its trip through the body. Normally the very immature and deeply basophilic forerunners of the red blood cells are scanty, and the bulk of the erythropoietic tissue is composed of the smaller cell forms with the different degrees of hemoglobinization of the cytoplasm (erythroblasts and normoblasts). According to Sabin,[7] Doan [8] and Peabody [9] the red cells ripen in the closed capillaries. The anoxemia in these closed capillaries is said to favor the multiplication and maturation of the red cells. When new red cells are needed, the closed capillaries are opened and the mature erythrocytes are discharged into the circulating blood.

The granulated cells are derived from an intermediate, nongranulated and basophilic cell (the myeloblast), which, according to my opinion, is distinctly different from the erythrogonia. Maturation is accomplished by the formation of granules in the cytoplasm, by a decrease of the basophilia of the cytoplasm, and by structural changes of the nucleus which lead to the lobulated nucleus of the mature granulocyte. The granulated cells are endowed with ameboid motility and pass easily through the wall of the sinusoids. The granulopoietic tissue of the normal marrow is made up chiefly of granulated cells with oval, bean and rod shaped nuclei and well differentiated granulation (myelocytes and metamyelocytes). The youngest, nongranulated cells (myeloblasts) and the cells with the earliest, deeply basophilic and coarse granulation (promyelocytes) are scanty.

The megakaryocytes, which originate from the same stem cell as the cells of the erythropoietic and granulopoietic series, are attached to the wall of the sinusoids and extend cytoplasmatic processes through the wall into the lumen of the sinusoids. These cytoplasmatic processes, which are cast off into the blood, form the blood platelets.[10] In addition to the cells described, the normal bone marrow contains lymphocytes, monocytes, plasma cells and a few mast cells. The lymphocytes often form small nodules, which are located in the proximity of arterial capillaries.

In sections of normal bone marrow, granulopoietic tissue equals or slightly exceeds erythropoietic tissue (Schilling,[11] Doan and Zerfas,[12] Dameshek [13] and others). In smears made from aspirated bone marrow fluid, from 12 to 25 per cent of the nucleated cells belong to the erythropoietic series (Arinkin,[14] Escudero and Varela,[15] Loewinger,[16] Nordenson,[17] Segerdahl,[18] Young and Osgood,[19] Van der Merwe,[20] Weiner and Kaznelson [21]). Of the granulated cells, from 0.6 to 3 per cent belong to the oxyphilic variety. There is approximately one megakaryocyte to 400 bone marrow cells (Nordenson,[17] Custer and Krumbhaar [22]). The monocytes vary between 2 and 7, the lymphocytes between 5 and 15 per cent.

It is evident that considerable variations exist in the cellular composition of the normal bone marrow. In addition to individual factors, age, sex, race, diet and stage of nutrition, the climate and the geographic location play an important rôle. In high altitudes the erythropoietic tissue will be more active than in the lowlands. Hedinger [2] refers to the significance of endemic goiter.

In the time allotted to me I shall be able to discuss only one of the functions of the bone marrow; namely,

7. Sabin, Florence R.: Bone Marrow, Physiol. Rev. **8**: 191 (April) 1928.
8. Doan, cited by Sabin.[7]
9. Peabody, F. W.: Hyperplasia of Bone Marrow in Man, Am. J. Path. **2**: 487 (Nov.) 1926.
10. Wright, J. H.: Die Entstehung der Blutplättchen, Virchows Arch. f. path. Anat. **186**: 55, 1906.
11. Schilling, Victor: Das Knochenmark als Organ: III. Funktion des Markparenchyms und Leukozytose, Deutsche med. Wchnschr. **51**: 516 (March 27) 1925.
12. Doan, C. A., and Zerfas, L. G.: The Rhythmic Range of the White Blood Cells in Human, Pathological Leukopenic and Leukocytic States, with a Study of Thirty-Two Human Bone Marrows, J. Exper. Med. **46**: 511 (Sept.) 1927.
13. Dameshek, William: Biopsy of the Sternal Bone Marrow: Its Value in the Study of Diseases of Blood Forming Organs, Am. J. M. Sc. **190**: 617 (Nov.) 1935.
14. Arinkin, M. J.: Die intravitale Untersuchungsmethodik des Knochenmarkes, Folia haemat. **38**: 233 (June) 1929.
15. Escudero, P., and Varela, E. M.: La biopsia del midollo osseo nelle sue applicazioni in ematologia, Haematologica, II Recen. **3**: 65, 1932.
16. Loewinger, Simon: Das Bild des Knochenmarkes bei der konstitutionellen haemolytischen Anaemie, Folia haemat. **54**: 27 (Nov.) 1935.
17. Nordenson, N. G.: Histologiska kvantitiva studier av normal och patologisk benmarg, Hygiea **96**: 193 (March 31) 1934.
18. Segerdahl, Elsa: Ueber Sternalpunktionen, Acta med. Scandinav. suppl. **64**, 1935.
19. Young, R. H., and Osgood, E. E.: Sternal Marrow Aspirated During Life, Arch. Int. Med. **55**: 186 (Feb.) 1935.
20. Van der Merwe, C. F.: Beenmergonderzoek in de Kliniek, Scheltema and Holkema, Amsterdam, 1935.
21. Weiner, W., and Kaznelson, P.: Ueber die zellige Zusammensetzung des Knochenmarkes nach Erfahrungen mittels der Sternalpunktion nach Seyfarth, Folia haemat. **32**: 233 (May) 1926.
22. Custer, R. P., and Krumbhaar, E. B.: The Histopathology of the Hemopoietic Tissue in Hemophilia, Am. J. M. Sc. **189**: 620 (May) 1935.

the formation of the blood cells. It may be mentioned, however, that as an important part of the reticuloendothelial system the bone marrow shares in all the functions that have been attributed to this system, as for instance the formation of the bile pigment, the production of antibodies and the storage of certain substances which are either foreign to the body or accumulate in the tissue fluids in excessive amounts. Thus in Gaucher's disease and in Niemann-Pick's disease, which, as the recent important studies of Thannhauser [23] have shown, is closely related to the former, the storing capacity of the reticulum cells of the bone marrow may be taxed to a degree that the production of the blood cells is diminished. The bone marrow contributes to the blood proteins, especially the fibrinogen, and produces more prothrombin than the spleen and the liver.

The mechanism that regulates the maturation of the blood cells and their discharge into the circulating blood and is responsible for the fairly constant cellular composition of the blood is still poorly understood. The granulated cells enter the blood in a certain rhythm, which shows small hourly accessions and a larger diurnal tide in the afternoon and at midnight.[7] Chemotaxis and the stimulating effect of degradation products of cells on the homologous cells (Myagow's principle) seem to play an important rôle. With regard to the erythropoiesis it has been stated that the new formation and mobilization of the erythrocytes is controlled by the oxygen tension of the blood. Hoff,[24] Dockhorn,[25] and Papilian [26] and others suggest a regulation of the activity of the bone marrow through the vegetative nervous system, but Naegeli [27] points out that the nerve fibers of the bone marrow are restricted to the proximity of the blood vessels. The depressing influence of the spleen on the bone marrow has been often discussed and seems to be borne out by experimental studies as well as by clinical observations. The hormones of the thyroid gland stimulate apparently the bone marrow, and Roger [28] suggests that the hormones of the pituitary gland and the gonads may have a similar effect (see also Naegeli [27]). According to Hubble,[29] the hormones of the suprarenal cortex increase the productivity of the erythropoietic and granulopoietic tissue, and the basophilic cells of the anterior lobe of the hypophysis exert a stimulating influence on all the blood forming cells and produce eventually polycythemia vera. This action of the anterior pituitary lobe may be an indirect one through the thyroid and the adrenal. The productivity of the normal bone marrow is tremendous. If one assumes that the average span of life of the erythrocyte is about four weeks, 900 billions of erythrocytes are produced daily by the bone marrow.[3] Finally it may be emphasized that the formation of the blood cells and the passage of the blood cells into the blood stream are two distinctly separate and independent phenomena.

23. Thannhauser, S. J.: Ueber Lipoidosen, Klin. Wchnschr. **13**: 161 (Feb. 3) 1934.
24. Hoff, cited by Dockhorn.[25]
25. Dockhorn, Else: Ueber die vegetative Regulation der Erythropoese, Folia haemat. **54**: 248, 1936.
26. Papilian, V., and Jianu, St. J.: Der Einfluss des vegetativen Systems auf das Knochenmark, Virchows Arch. f. path. Anat. **264**: 361, 1927.
27. Naegeli, Otto: Blutkrankheiten und Blutdiagnostik, ed. 5, Berlin, Julius Springer, 1931.
28. Roger, G. H.: La moelle osseuse, in Roger, G. H., and Binet, Léon: Traité de physiologie normale et pathologique, ed. 2, Paris, Masson et Cie, **7**, 1934.
29. Hubble, D.: The Influence of the Endocrine System in Blood Disorders, Lancet **2**: 113 (July 15) 1933.

THE ANEMIAS

In anemia the erythropoietic tissue of the bone marrow may be increased (hyperplastic), diminished (hypoplastic) or exhausted (aplastic), or it may present deviations from the normal mode of maturation with the formation of abnormal red cells (dysplasia). In the active stage of pernicious anemia the dysplasia of the erythropoiesis is the outstanding feature. The red marrow usually replaces most of the fatty marrow, although in some cases a considerable amount of adipose marrow may persist.[30] The erythropoietic tissue greatly exceeds the granulopoietic tissue, and the megakaryocytes are few in number and often degenerated. The erythropoietic tissue contains many very immature, large basophilic cells, which are often found in mitotic division, and it is already in this early stage of differentiation that the hemoglobinization of the cytoplasm begins. Owing to this premature hemoglobinization, large cells result the cytoplasm of which is very rich in hemoglobin and the nucleus of which has the dense, reticular structure of the hematogonia (the noyau perle of the French authors). These cells are the megaloblasts, which were first described by Paul Ehrlich and which are typical of pernicious anemia and certain other forms of hyperchromic macrocytic anemia. Turnbull [5] emphasizes that much confusion has been caused by the erroneous identification of the megaloblast with the earliest cell forms of the erythropoiesis. The latter are found in many types of severe anemia. The megaloblast of pernicious anemia is a cell which contains hemoglobin and which loses its nucleus by pyknosis and extrusion like the normoblast. The product of the megaloblastic erythropoiesis is rich in hemoglobin, a real functional giant which is doomed to quick destruction, since it is an abnormal cell. The majority of the investigators consider the megaloblast as characteristic of pernicious anemia (Arinkin,[14] Bécart,[31] Dameshek,[13] Holmes and Broun,[32] Jagic and Klima,[33] Loewinger,[16] Naegeli,[27] Peabody,[34] Piney,[35] Segerdahl,[18] Tempka and Braun,[36] Turnbull,[5] Van der Merwe [20] and others). Van der Merwe [20] recommends examination of the sternal bone marrow for the differential diagnosis of pernicious anemia and carcinoma of the stomach with perniciosa-like blood changes. In contrast to the proliferation of the erythrogonias and their abnormal maturation into megalocytes and gigantocytes, erythroblasts and normoblasts are scanty in the bone marrow of cases of pernicious anemia. The granulopoietic tissue which is relatively diminished in quantity presents certain anomalies. Thus the myeloblasts are increased in number and there is a premature lobulation of the nucleus, which starts at the time when the granulation is still scanty and young. The lobulation of the nucleus progresses and when the mature leukocyte is formed its nucleus has many more segments than the normal leukocyte (so-called shifting to the right). When the dysplasia of the bone marrow of pernicious anemia

30. Sheard, Arthur: Pernicious Anemia and Aplastic Anemia, New York, William Wood & Co., 1924.
31. Bécart, A.: La ponction de la moella osseuse sternale dans l'anemie pernicieuse, Bull. et mém. Soc. méd. d. hôp. de Paris **138**: 472 (Oct. 12) 1934.
32. Holmes, W. F., and Broun, G. O.: Clinical Study of Bone Marrow by the Method of Sternal Puncture, Proc. Soc. Exper. Biol. & Med. **30**: 1306 (June) 1933.
33. Jagic and Klima, cited by Young and Osgood.[19]
34. Peabody, F. W.: The Pathology of the Bone Marrow in Pernicious Anemia, Am. J. Path. **3**: 179 (May) 1927.
35. Piney, A.: The Nucleated Red Cells Found in the Circulation in Pernicious Anemia, J. Path. & Bact. **27**: 249 (July) 1924.
36. Tempka, T., and Braun, B.: Das morphologische Verhalten des Sternalpunktates in verschiedenen Stadien der perniciösen Anämie und seine Wandlungen unter dem Einfluss der Therapie, Folia haemat. **48**: 355, 1932.

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approaches the stage of exhaustion, plasma cells become a conspicuous feature.[37] Peabody [38] and many others have observed that in pernicious anemia the reticulum cells of the bone marrow become transformed into macrophages which engulf many erythrocytes. This erythrophagocytosis seems to be pronounced only in autopsy material.

The antianemic treatment prompts a reversion of the megaloblastic erythropoiesis to the normoblastic type (Bécart,[31] Dameshek,[13] Peabody,[34] Van der Merwe [20]). A similar reversion takes place during a spontaneous remission. The megaloblasts disappear, the most immature cell forms decrease in number, and erythroblasts and normoblasts dominate the picture. The red marrow recedes to the trunk. Nordenson [17] states that with liver therapy the return to the normal blood formation requires approximately twelve days. Segerdahl [18] observed, after large doses of liver, a disappearance of the megaloblasts within twenty-four hours and suggests the determination of the disappearing time as a criterion for the potency of an antianemic substance. Under the influence of infectious irritation the dysplastic bone marrow of pernicious anemia may fail to respond to antianemic treatment.[39]

In the macrocytic anemia of sprue the cytologic picture of the bone marrow is similar to that of pernicious anemia but the megaloblastic transformation is decidedly less marked (Witts, Fairley and Goodhart,[40] Rhoads and Castle,[41] Turnbull [5]). The response to effective treatment is the same as in pernicious anemia. The macrocytic anemia associated with diseases of the liver fails to show the megaloblastic reaction of the bone marrow (Rossier,[42] Melamos [43]).

The bone marrow of the patients with hypochromic microcytic anemia is hyperplastic and the erythropoiesis which does not show any obvious morphologic anomalies predominates over the granulopoiesis. Megaloblasts are absent (Dameshek,[13] Van der Merwe [20]) but small groups of erythrogonias are found. There are numerous normoblasts and, in severe cases, also many polychromatophilic erythroblasts.[18] It has been suggested that the deficiency in iron may interfere with the final stages of erythrocytic maturation. Under adequate iron therapy the hyperplastic marrow recedes.[5]

Loewinger,[16] Young and Osgood,[19] Dameshek [13] and Weiner and Kaznelson [21] describe a great predominance of the nucleated red cells in the bone marrow in cases presenting hemolytic family jaundice. The nucleated red cells vary considerably in size, and macronormoblasts and micronormoblasts are found. After splenectomy the macronormoblasts disappear but the micronormoblasts persist.[21] According to Jones,[44] the erythropoiesis in acholuric family jaundice shows a peculiar though nonspecific anomaly which consists of the direct transformation of the reticular cells into normoblasts without the intermediary stages of differentiation. In sickle cell anemia the nucleated red cells of the bone marrow are of normal shape.[45] In the erythroblastic anemias of infancy and early childhood the bone marrow is extremely hyperplastic, leading to a more or less marked reduction of the bony structures. The marrow is crowded with erythroblasts and there are also many erythrogonias. Normoblasts are often less conspicuous than the earlier foms of eythropoiesis. The granulopoietic tissue, which is relatively scanty, may be rich in oxyphilic myelocytes, and the megakaryocytes are numerous.

In typical aplastic anemia the bone marrow fails as a unit (Frank,[46] Lescher and Hubble,[47] Middleton and Meyer [48] and many others). Pure red cell aplasia is very rare. A considerable number of authors have been struck by the fact that in cases which clinically show most of the symptoms of aplastic anemia the bone marrow is found normal or even hyperplastic (see for instance Thompson, Richter and Edsall [49]). These cases, however, usually show some evidences of regeneration in the peripheral blood and should properly be separated as pseudo-aplastic anemia from the true aplastic anemia.[50] In analogy to the observations of Frank,[46] Sheard,[30] Dameshek,[13] Young and Osgood [19] and others, I have found in typical cases of aplastic anemia an extreme exhaustion of the bone marrow. Careful search may disclose an occasional small nest of myeloid cells, but the majority of the cells that are found between the fat cells prove to be plasma cells, lymphocytes, monocytes and proliferated histiocytes. There are no apparent differences in the histologic picture of the bone marrow between the cases of idiopathic and symptomatic aplastic anemia. In osteosclerotic anemia the bone marrow changes into connective tissue, which later becomes ossified. The ossification of the marrow cavities may be secondary to an aplasia of the bone marrow, as for instance in the senile osteosclerotic anemia, or it may be due to a congenital anomaly of the bone forming tissue, as in Albers-Schoenberg's marble bone disease.

POLYCYTHEMIA VERA

Vaquez's disease is associated with a hyperplasia of all the elements of the bone marrow (hyperplastic panmyelopathy of Askanazy). Reznikoff, Foot and Bethea [51] have recently advanced the theory that the increase in red cells may be the reaction to a fibrosis of the wall of the capillaries and arterioles of the bone marrow which causes an anoxemia and a compensatory excessive erythropoiesis. Whether this explanation holds true for all cases of polycythemia remains to be shown. It does not take into account that not only the erythropoietic tissue is hyperplastic but also the granulopoietic tissue and the megakaryocytes, and that polycythemia vera shows the tendency to change into myelogenous leukemia. Attempts have also been made to consider polycythemia vera the counterpart of per-

37. Whitby, L. E. H., and Britton, C. J. C.: Disorders of the Blood, Philadelphia, P. Blakiston's Son & Co., 1935.
38. Peabody, F. W., and Broun, G. O.: Phagocytosis of Erythrocytes in the Bone Marrow, with Special Reference to Pernicious Anemia, Am. J. Path. **1**: 169 (March) 1925.
39. Bethell, F. H.: The Response to Infection in Bone Marrow Dyscrasia, J. Lab. & Clin. Med. **20**: 362 (Jan.) 1935.
40. Witts, L. S.; Fairley, N. H., and Goodhart, G.: Discussion on Megalocytic Anemia of Tropical and Nontropical Countries, Proc. Roy. Soc. Med. **35**: 1703 (Sept.) 1932.
41. Rhoads, C. P., and Castle, W. B.: The Pathology of the Bone Marrow in Sprue Anemia, Am. J. Path. (supp.) **9**: 813, 1933.
42. Rossier, J.: Etude sur l'état de la moelle osseuse dans la cirrhoose hépatique, Ann. d'anat. path. **9**: 245 (March) 1932.
43. Melamos, B.: Das rote Blutbild bei Lebererkrankungen, Deutsches Arch. f. klin. Med. **177**: 209, 1935.
44. Jones, P.: The Reticulo-Endothelial Origin of Erythrocytes in Biopsied Human Marrow, Anat. Rec. (supp.) **61**: 21, 1935.
45. Jaffé, R. H.: Die Sichelzellenanämie, Virchows Arch. f. path. Anat. **265**: 452, 1927.
46. Frank, E.: Aleukia haemorrhagica, in Schittenhelm, A.: Handbuch der Krankheiten des Blutes und der blutbildenden Organe, Berlin, Julius Springer, **2**: 390, 1925.
47. Lescher, F. G., and Hubble, D.: A Correlation of Certain Blood Diseases on the Hypothesis of Bone Marrow Deficiency or Hypoplasia, Quart. J. Med. **1**: 425 (July) 1932.
48. Middleton, W. S., and Meyer, O. O.: Marrow Insufficiency, Ann. Int. Med. **8**: 1575 (June) 1935.
49. Thompson, W. P.; Richter, M. N., and Edsall, K. S.: An Analysis of So-Called Aplastic Anemia, Am. J. M. Sc. **187**: 77 (Jan.) 1934.
50. Krumbhaar, E. B.: Editor's footnote in Thompson, Richter and Edsall.[49]
51. Reznikoff, Paul; Foot, N. C., and Bethea, J. M.: Etiologic and Pathologic Factors in Polycythemia Vera, Am. J. M. Sc. **189**: 753 (June) 1935.

nicious anemia and to explain it on the basis of an excessive production of the hematopoietic (antianemia) substance which is supposed to be formed in the stomach (Morris,[52] Hitzenberger,[53] Baráth and Fülöp [54]).

AGRANULOCYTOSIS

Similar to the disturbances of erythropoiesis one can distinguish between hyperplasia, hypoplasia, aplasia and dysplasia of the granulopoietic tissue. Agranulocytosis is one of the most striking examples of the discrepancies that may exist between the conditions present in the peripheral blood and the condition of the bone marrow. Schultz [55] and after him many authors have described an aplasia of the granulopoietic tissue as characteristic of agranulocytosis, and unquestionably in some instances the disappearance of the granulocytes from the circulating blood is due to an exhaustion of the granulopoiesis. In their recent book on agranulocytosis, Sabrazès and Saric [56] expressly state that the bone marrow of the sternum, vertebral bodies and epiphysis of the long bones is devoid of granulocytic elements. Soon after Schultz's first publication it became, however, apparent that aplasia of the granulopoietic tissue was not the rule in a granulocytosis and that cases occurred in which the bone marrow was either normal or hyperplastic. The combination of a profound neutropenia of the circulating blood with an active multiplication of the progenitors of the neutrophils in the bone marrow induced Fitz Hugh and Krumbhaar [57] to suggest that the essential disturbance in agranulocytosis might be an arrest of the maturation of the granulocytes. In a subsequent study Fitz Hugh and Comroe [58] brought forward additional proof for this explanation, which was also greatly strengthened by the careful histologic investigations of Custer [59] and Darling, Parker and Jackson.[60] Custer [59] pointed out that the failure of the proliferating myeloblasts to differentiate into myelocytes and neutrophilic leukocytes might result from the lack of an intrinsic maturation factor. Similar to pernicious anemia, in which the erythron is affected, agranulocytosis then would be a dysplastic condition of the granulopoiesis. From the cases of agranulocytosis which I have studied I have obtained the impression that the early cell forms of the granulopoietic series proliferate but that they fail to mature because they degenerate. This degeneration, which may be caused by toxins or which may be an allergic phenomenon, explains, I believe, better the fulminating and so often rapidly fatal course of the disease than a mere maturation arrest. Tissue cultures made from the bone marrow of patients suffering from agranulocytosis may help to decide whether it is a maturation arrest or a degeneration that prevents the young granulopoietic cells to ripen. In the cases in which the peripheral neutropenia is associated with an active proliferation of healthy, young granulocytes in the bone marrow, a disproportion between the supply and the destruction of the mature granulocytes in the circulating blood may exist, just as in hemolytic anemia the increased erythropoiesis fails to compensate for the destruction of the erythrocytes. The investigators who distinguish sharply between idiopathic and symptomatic agranulocytosis emphasize that the maturation arrest is pathognomonic of the idiopathic form and is not observed in the symptomatic form. The other elements of the bone marrow do not seem to be affected in agranulocytosis. Prolonged agranulocytosis leads to a proliferation of the plasma cells and histiocytes of the bone marrow.

THE LEUKEMIAS

In leukemia the bone marrow is usually very hyperplastic. The microscopic picture of the leukemic bone marrow depends on the type of leukemia, but within the same group considerable individual variations may occur. In chronic myelogenous leukemia there is a diffuse hyperplasia of the bone marrow and I have often observed that the relation between erythropoiesis and granulopoiesis is maintained at the normal level. The granulopoietic tissue is composed mainly of myeloblasts and promyelocytes. The latter are unusually large and their granulation is atypical, irregular and scanty. The myelocytes may mature to fairly normal neutrophilic leukocytes. In cases presenting very high counts of the white blood cells I have frequently found that the neutrophils which are derived from the abnormal myelocytes are small and crippled with a poorly defined granulation, a scanty cytoplasm and an abnormally lobulated nucleus. Thus there is in these cases not only a hyperplasia but also a dysplasia of the granulopoiesis. Some cases of myelogenous leukemia show a predominance of eosinophilic or basophilic myelocytes and leukocytes.

The more rapid the course of the leukemia, the greater is usually also the percentage of the earliest cell forms. In acute myelogenous leukemia the bone marrow is packed with myeloblasts. In many cases of acute leukemia, especially in children, the hemocytoblast excels by far all other cells. The hemocytoblast may show a greater tendency to differentiate in the erythropoietic direction than in the granulopoietic direction. There are cases of acute and of subacute leukemia in which the proliferation of the megakaryocytes and their precursors is the outstanding feature, and other cases in which the bone marrow consists chiefly of immature monocytes. A few cases of leukemia have been described in which the bone marrow is composed of plasma cells.[61]

In most of the cases of lymphatic leukemia the bone marrow resembles lymphatic tissue. Granulopoietic and erythropoietic tissue, however, persists in the form of small perivascular islands which, under the influence of complicating infections, may become greatly activated and replace most of the lymphatic tissue. In this connection I mention the atypical cases of lymphatic leukemia in which the proliferation of the lymphatic cells is confined to the bone marrow, and the liver, the spleen and the lymph nodes are not affected (medullary

52. Morris, cited by Baráth and Fülöp.[54]
53. Hitzenberger, cited by Baráth and Fülöp.[54]
54. Baráth, Emil, and Fülöp, Josef: Untersuchungen über die pathogenetischen Beziehungen zwischen perniciöser Anämie und splenomegaler Polycythämie, Ztschr. f. klin. Med. **129:** 172, 1935.
55. Schultz, W.: Gangräneszierende Prozesse und Defekt des Granulocytensystems, Deutsche med. Wchnschr. **44:** 1495, 1922.
56. Sabrazès, Jean, and Saric, René: Angines lympho-monocytaires, agranulocytoses, leucémies, leucopéniques, Paris, Masson et Cie, 1935.
57. Fitz Hugh, T., and Krumbhaar, E. B.: Myeloid Cell Hyperplasia of the Bone Marrow in Agranulocytic Angina, Am. J. M. Sc. **183:** 104 (Jan.) 1932.
58. Fitz Hugh, T., and Comroe, B. J.: Agranulocytic Angina (Pernicious Leukopenia), Am. J. M. Sc. **185:** 552 (April) 1933.
59. Custer, R. P.: Studies on the Structure and Function of Bone Marrow: IV. Bone Marrow in Agranulocytosis, Am. J. M. Sc. **189:** 507 (April) 1935.
60. Darling, R. C.; Parker, Frederic, and Jackson, Henry: The Pathologic Changes in the Bone Marrow in Agranulocytosis, Am. J. Path. **12:** 1 (Jan.) 1936.
61. Osgood and Hunter, W. C.: Plasma Cell Leukemia, Folia haemat. **52:** 369, 1934.

lymphatic leukemia of Aubertin,[62] Liotta,[63] Fries,[64] Hirschfeld[65] and Zanatz[66]).

It is in the atypical cases of leukemia in which the blood examination or the clinical picture does not correspond to the classic description that the biopsy of the bone marrow will be found very useful. I refer to the acute aleukemic leukemias, which are often confused with aplastic anemia, thrombocytopenic purpura or septicemia, and to chronic aleukemic myelogenous leukemia, which is frequently diagnosed as morbus Banti or sepsis lenta. During the past few years I have studied forty-seven cases of acute leukemia seven of which were aleukemic throughout their entire course, and nine cases of chronic myelogenous leukemia two of which had never shown a leukemic blood picture. In none of these nine cases was the leukemia recognized during life. The value of a new method can be appreciated if one is familiar with its limitations. There are rare cases of leukemia in which the bone marrow biopsy is disappointing. Long standing myelogenous leukemia, in particular its aleukemic variety, may finally lead to an exhaustion of the bone marrow and the marrow becomes replaced by connective tissue or bone (osteosclerotic aleukemic myelosis). In the early stages of very acute cases of leukemia the bone marrow may be hemorrhagic and poor in myeloid cells (Jaffé,[67] Segerdahl[18]).

THROMBOCYTOPENIC PURPURA

According to the current conception the megakaryocytes are the source of the blood platelets, and thrombocytopenic purpura (Werlhof's disease) has therefore often been attributed to an alteration of these cells. Because of the loss of blood from the multiple hemorrhages the bone marrow is hyperplastic. The megakaryocytes are numerous. I have counted from two to four megakaryocytes per hundred bone marrow cells. Many of them are well preserved, except that they are smaller than normal and that their fine, azurophilic granulation is often missing. This disappearance of the specific granulation of the megakaryocytes has been stressed by Frank[68] and Schmincke,[69] and Frank believes that it may be due to a maturation arrest. Frank[68] and Schmincke[69] describe also severe degenerative changes which I have not been able to find. It should be remembered that single degenerating megakaryocytes are present in the normal bone marrow. Rohr[70] refers to a peculiar configuration of the megakaryocytes in thrombocytopenic purpura: the cytoplasmatic protrusions disappear and the cell borders become straight and sharp. After splenectomy the budding of the cytoplasm is said to reappear. From these observations it would seem that thrombocytopenic purpura is due to a dysplasia and not to an exhaustion of the thrombocytopoiesis. Falconer and Morris[71] advise against biopsy of the bone marrow in cases of purpura.

HEMOPHILIA

In a recent publication Custer and Krumbhaar[22] describe the appearance of the bone marrow in three cases of hemophilia. They emphasize that the erythropoiesis and granulopoiesis are strictly normal, both being very active, and that the megakaryocytes are distinctly more numerous than normal. The morphology of the megakaryocytes shows no anomalies.

TUMORS OF THE BONE MARROW

It is interesting to note that the plasma cell, which plays only a minor rôle in normal blood marrow, is the most common source of primary neoplasms of the bone marrow. Of ten myelomas that I have recently studied, eight were composed of plasma cells, one of myelocytes and one of lymphoblasts. In the literature there are also reports on erythroblastic myelomas. Of the other tumors that originate in the bone marrow I mention reticular cell lymphosarcoma, liposarcoma and benign angioma and angiosarcoma.

BONE MARROW BIOPSY

The upper portion of the sternum, at the height of the second or third rib, has been found the most suitable place for the removal of samples of the bone marrow. The sternal marrow remains active throughout life, and the anterior cortex of the bone is only from 0.9 to 2 mm. thick. The thickness of the sternum amounts to about 1 cm. (Van der Merwe[20]). Two methods have been recommended, one of which consists in the removal of a core of marrow with the aid of a small trephine (Custer,[59] Dameshek,[13] Tuohy and Gillespie[72]) while the other is based on the aspiration of marrow fluid through a modified spinal puncture needle (Amprino and Penati,[73] Arinkin,[14] Baserga,[74] Bécart,[31] Henning,[75] Klima and Rosegger,[76] Loewinger,[16] Reich,[77] Segerdahl,[18] Van der Merwe,[20] Young and Osgood[19]). For research and systematic studies the former method is the method of choice, since it permits sectioning of the marrow with preservation of the topographic relations of the cells and also the preparation of smears and imprints. Aspiration biopsy has the advantage of simplicity and does not require the technical skill that is necessary for the first method. With aspiration biopsy one must keep in mind that the aspirated fluid does not give the correct picture of the bone marrow in situ because cells that are still connected with the reticulum are less apt to become mobilized than cells that are free. The inflowing blood will necessarily dilute the aspirated material and it is therefore advisable not to aspirate more than 0.1 or 0.2 cc. After coagulation in a small watch glass the aspirated fluid can be fixed and sectioned like a piece of bone marrow (Amprino and Penati[73]). In the majority of cases a carefully prepared spread of the marrow fluid will be found sufficient to obtain definite information as to the condition of the bone marrow.

531 Grant Place.

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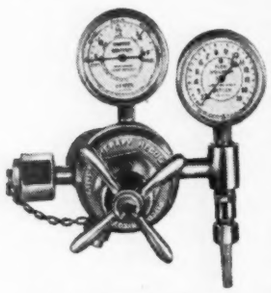
Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.
HOWARD A. CARTER, Secretary.

LINDE OXYGEN THERAPY REGULATOR TYPE R-50 ACCEPTABLE

Manufacturer: Linde Air Products Company, New York.

This oxygen therapy regulator is a diaphragm reducing valve of the two stage or double reduction type.



Linde Oxygen Therapy Regulator Type R-50.

The Linde Oxygen Therapy Regulator, Type R-50, is identical to the Type R-51, previously accepted by the Council on Physical Therapy (THE JOURNAL, June 9, 1934, p. 1941) with the following exceptions: Instead of having two outlets calibrated for flows up to 8 and 24 liters per minute respectively with corresponding gage markings, the type R-50 has been simplified for certain uses. The simplification consists in that only one outlet is provided and the low pressure gage has only one reading on its dial, calibrated up to 15 liters per minute. Otherwise the mechanism and controls of the two regulators are quite similar.

The regulator was investigated in a clinic acceptable to the Council. It was used for several months and proved satisfactory for the purpose intended.

In view of the favorable performance of this unit, the Council on Physical Therapy voted to include the Linde Oxygen Therapy Regulator, Type R-50, in its list of accepted devices.

THERM-A-MODE NOT ACCEPTABLE

Manufacturer: Therm-A-Mode, Inc., Orange, N. J.

This is a blanket intended for the induction of diaphoresis and also for fever therapy. According to the firm it is called "infrared Therm-A-Mode for fever therapy." It is claimed to have a heating range of from 90 to 140 F.

The device is made with an outer layer of blanket material and with a lining of impermeable material, apparently rubber. Between these two are other layers of material between which are incorporated the heating elements. A rheostat to control the amount of current furnished to the heating elements, and thereby control the heating of the blanket, is supplied. The device is intended to be used in the office of a physician, and cabinets of different sizes are furnished. One of these is said to be portable and intended for treatment at the home of the patient.

The Therm-A-Mode is claimed, by the firm, to be of value in diseases which are due to pathogenic organisms or to an accumulation of toxic substances within the body, and to have been used successfully in relieving pain. Its therapeutic value is also advanced for shock of any kind and for eclampsia. The Therm-A-Mode is said to induce diaphoresis more effectively than other methods, and its use is advocated to prevent coma and convulsions and to treat common colds, influenza, acute bronchitis, pneumonia and other acute respiratory infections. It is also said to be of value in promoting sleep and in reducing systolic blood pressure. In connection with the postoperative care of patients the firm claims that, "because temperature in postoperative care is almost as vital to the patient as the operation itself, Therm-A-Mode is rapidly replacing the sometimes dangerous hot water bottles, unapproved heating pads and wet packs."

The Council's investigator reported that the blanket is heavy and its weight uncomfortable to the patient. The chief objection to its use for fever therapy is that the patient's temperature rises very slowly, even when the maximum current is applied. This might not be a serious objection for patients who are being treated for shock or for arthritis, in which it is not necessary that a high temperature be attained or maintained; in shock, however, too slow a rise in temperature would rob the device of much of its value because, when heat is needed to treat a patient in shock, the need is urgent and pressing, and a device which cannot heat the patient fairly rapidly would be of little value.

A slit in the blanket has been provided to enable the physician or nurse to take the rectal temperature of the patient. In practical use, however, it is extremely difficult to use this slit, even when the patient is a normal person, because in order to insert the thermometer the patient has to be turned on the side, and the act of turning inside the blanket throws the slit in the blanket out of relation to the anal opening, therefore making the procedure rather awkward and difficult. Moreover, if the manufacturer's instruction to wrap the patient in a blanket before placing him in the Therm-A-Mode is followed, the presence of this additional blanket makes it impossible to utilize the slit for rectal temperature or to take the rectal temperature at all. Under these circumstances, the temperature of the patient would have to be taken by mouth. The Council has not been furnished with convincing evidence of the safety of the blanket.

As a means of inducing a high temperature, especially if this is to be maintained for a number of hours, this device is regarded as ineffectual and unpractical.

In view of the aforementioned reasons, the Council voted not to include the Therm-A-Mode electric blanket in its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.
PAUL NICHOLAS LEECH, Secretary.

ALLERGENIC EXTRACTS-LEDERLE (See New and Nonofficial Remedies, 1935, p. 28).

The following additional products have been accepted:

Undiluted Extracts: *Apple Allergenic Extract-Lederle*[5]; *Apricot Allergenic Extract-Lederle*[5]; *Blackberry Allergenic Extract-Lederle*[5]; *Blueberry Allergenic Extract-Lederle*[5]; *Cantaloupe Allergenic Extract-Lederle*[5]; *Cherry Allergenic Extract-Lederle*[5]; *Cranberry Allergenic Extract-Lederle*[5]; *Currant (Red) Allergenic Extract-Lederle*[5]; *Date Allergenic Extract-Lederle*[5]; *Fig Allergenic Extract-Lederle*[5]; *Gooseberry Allergenic Extract-Lederle*[5]; *Grape Allergenic Extract-Lederle*[5]; *Grapefruit Juice Allergenic Extract-Lederle*[5]; *Grapefruit Peel Allergenic Extract-Lederle*[5]; *Huckleberry Allergenic Extract-Lederle*[5]; *Juniper Berry Allergenic Extract-Lederle*[0]; *Lemon Juice Allergenic Extract-Lederle*[5]; *Lemon Peel Allergenic Extract-Lederle*[5]; *Lime Allergenic Extract-Lederle*[5]; *Melon (Honey Dew) Allergenic Extract-Lederle*[5]; *Melon (Casaba) Allergenic Extract-Lederle*[5]; *Peach Allergenic Extract-Lederle*[5]; *Peach Skin Allergenic Extract-Lederle*[5]; *Pear Allergenic Extract-Lederle*[5]; *Pineapple Allergenic Extract-Lederle*[5]; *Plum Allergenic Extract-Lederle*[5]; *Pomegranate Allergenic Extract-Lederle*[5]; *Prune Allergenic Extract-Lederle*[5]; *Quince Allergenic Extract-Lederle*[5]; *Raisin Allergenic Extract-Lederle*[5]; *Raspberry (Red) Allergenic Extract-Lederle*[5]; *Rhubarb Allergenic Extract-Lederle*[5]; *Strawberry Allergenic Extract-Lederle*[5]; *Tangerine Allergenic Extract-Lederle*[5]; *Watermelon Allergenic Extract-Lederle.*[5]

Undiluted and 1:10 Dilution: *Alligator Pear Allergenic Extract-Lederle*[5]; *Allspice Allergenic Extract-Lederle*[0]; *Anchovy Allergenic Extract-Lederle*[5]; *Artichoke Allergenic Extract-Lederle*[5]; *Artichoke (Jerusalem) Allergenic Extract-Lederle*[5]; *Asparagus Allergenic Extract-Lederle*[5]; *Barley Allergenic Extract-Lederle*[3]; *Bass Allergenic Extract-Lederle*[3]; *Bay Leaf Allergenic Extract-Lederle*[7]; *Bean (Kidney) Allergenic Extract-Lederle*[2]; *Bean (Mexican) Allergenic Extract-Lederle*[2]; *Bean (Navy) Allergenic Extract-Lederle*[2]; *Bean (Pea) Allergenic Extract-Lederle*[2]; *Bean (String) Allergenic Extract Lederle*[5]; *Beet Allergenic Extract-Lederle*[5]; *Bluefish Allergenic Extract-Lederle*[3]; *Broccoli Allergenic Extract-Lederle*[5]; *Brussels Sprouts Allergenic Extract-Lederle*[5]; *Butterfish Allergenic Extract-Lederle*[3]; *Cabbage Allergenic Extract-Lederle*[5]; *Carp Allergenic Extract-Lederle*[3]; *Carrot Allergenic Extract-Lederle*[5]; *Catfish Allergenic Extract-Lederle*[3]; *Cauliflower Allergenic Extract-Lederle*[5]; *Caviar Allergenic Extract-Lederle*[3]; *Celery Allergenic Extract-Lederle*[5]; *Chicory Allergenic Extract-Lederle*[5]; *Chive Allergenic Extract-Lederle*[5]; *Cinnamon Allergenic Extract-Lederle*[0]; *Citron Allergenic Extract-Lederle*[5]; *Clam Allergenic Extract-Lederle*[0]; *Clove Allergenic Extract-Lederle*[0]; *Coffee Bean Allergenic Extract-Lederle*[1]; *Corn (Sweet) Allergenic Extract-Lederle*[5]; *Cucumber Allergenic Extract-Lederle*[5]; *Dandelion Allergenic Extract-Lederle*[5]; *Deer*

Meat Allergenic Extract-Lederle[3]; *Dill Leaves Allergenic Extract-Lederle*[7]; *Duck Meat Allergenic Extract-Lederle*[3]; *Egg Plant Allergenic Extract-Lederle*[5]; *Endive Allergenic Extract-Lederle*[5]; *Flounder Allergenic Extract-Lederle*[3]; *Fluke Allergenic Extract-Lederle*[3]; *Frog's Legs Allergenic Extract-Lederle*[3]; *Garlic Allergenic Extract-Lederle*[5]; *Ginger Allergenic Extract-Lederle*[9]; *Goat Meat Allergenic Extract-Lederle*[3]; *Goat Milk Allergenic Extract-Lederle*[6]; *Goose Meat Allergenic Extract-Lederle*[3]; *Guinea Hen Meat Allergenic Extract-Lederle*[3]; *Haddock Allergenic Extract-Lederle*[3]; *Halibut Allergenic Extract-Lederle*[3]; *Henna Allergenic Extract-Lederle*[7]; *Herring Allergenic Extract-Lederle*[3]; *Hops Allergenic Extract-Lederle*[7]; *Horse Meat Allergenic Extract-Lederle*[3]; *Horseradish Allergenic Extract-Lederle*[5]; *Kole Allergenic Extract-Lederle*[5]; *Lentil Allergenic Extract-Lederle*[2]; *Lettuce Allergenic Extract-Lederle*[5]; *Lobster Allergenic Extract-Lederle*[3]; *Mace Allergenic Extract-Lederle*[9]; *Mackerel Allergenic Extract-Lederle*[3] *Mushroom Allergenic Extract-Lederle*[5]; *Nutmeg Allergenic Extract-Lederle*[9]; *Oat (Meal) Allergenic Extract-Lederle*[2]; *Okra Allergenic Extract-Lederle*[5]; *Olive Allergenic Extract-Lederle*[5]; *Onion Allergenic Extract-Lederle*[5]; *Oyster Allergenic Extract-Lederle*[3]; *Oyster Plant Allergenic Extract-Lederle*[5]; *Parsley Allergenic Extract-Lederle*[5]; *Parsnip Allergenic Extract-Lederle*[5]; *Pea (Black-Eyed) Allergenic Extract-Lederle*[2]; *Pepper (Green) Allergenic Extract-Lederle*[5]; *Peppermint Allergenic Extract-Lederle*[7]; *Perch Allergenic Extract-Lederle*[3]; *Pickerel Allergenic Extract-Lederle*[3]; *Pike Allergenic Extract-Lederle*[3]; *Pompano Allergenic Extract-Lederle*[3]; *Potato (Sweet) Allergenic Extract-Lederle*[5]; *Pumpkin Allergenic Extract-Lederle*[5]; *Quail Allergenic Extract-Lederle*[3]; *Rabbit Meat Allergenic Extract-Lederle*[3]; *Rabbit Serum Allergenic Extract-Lederle*[6]; *Radish Allergenic Extract-Lederle*[5]; *Sage Allergenic Extract-Lederle*[7]; *Salmon Allergenic Extract-Lederle*[3]; *Sardine Allergenic Extract-Lederle*[3]; *Scallion Allergenic Extract-Lederle*[5]; *Scallop Allergenic Extract-Lederle*[3]; *Senna Allergenic Extract-Lederle*[7]; *Shad Allergenic Extract-Lederle*[3]; *Shad Roe Allergenic Extract-Lederle*[3]; *Shrimp Allergenic Extract-Lederle*[3]; *Smelt Allergenic Extract-Lederle*[3]; *Soy Bean Allergenic Extract-Lederle*[2]; *Squab Allergenic Extract-Lederle*[3]; *Squash Allergenic Extract-Lederle*[5]; *Squid Allergenic Extract-Lederle*[3]; *Sturgeon Allergenic Extract-Lederle*[3]; *Sugar Cane Allergenic Extract-Lederle*[5]; *Swiss Chard Allergenic Extract-Lederle*[5]; *Tapioca Allergenic Extract-Lederle*[2]; *Tea Leaf Allergenic Extract-Lederle*[7]; *Terrapin Allergenic Extract-Lederle*[3]; *Thyme Allergenic Extract-Lederle*[9]; *Tomato Allergenic Extract-Lederle*[5]; *Trout (Lake) Allergenic Extract-Lederle*[3]; *Trout (Sea) Allergenic Extract-Lederle*[3]; *Tuna Fish Allergenic Extract-Lederle*[3]; *Turkey Meat Allergenic Extract-Lederle*[3]; *Turnip Allergenic Extract-Lederle*[5]; *Vanilla Allergenic Extract-Lederle*[7]; *Watercress Allergenic Extract-Lederle*[5]; *Weakfish Allergenic Extract-Lederle*[3]; *Whitefish Allergenic Extract-Lederle*[3]; *Whiting (Fish) Allergenic Extract-Lederle.*[3]

1:10 Dilutions: *Cow Serum Allergenic Extract-Lederle*[6]; *Eel Allergenic Extract-Lederle*[3]; *Jack Bean Allergenic Extract-Lederle*[7]; *Leek Allergenic Extract-Lederle*[5]; *Sole Allergenic Extract-Lederle.*[3]

Products marketed in dilutions representing 1 mg. and 0.001 mg. of nitrogen per cc.: *Silk (Silkworm) Allergenic Extract-Lederle.*[11]

Products marketed in dilutions representing 0.2, 0.1 and 0.001 mg. of nitrogen per cc.: *Millet Seed Allergenic Extract-Lederle*[9]; *Mule Dander Allergenic Extract-Lederle.*[4]

Products marketed in dilutions representing 0.2 mg. and 0.001 mg. of nitrogen per cc.: *Anise Seed Allergenic Extract-Lederle*[9]; *Canary Seed Allergenic Extract-Lederle.*[9]

Products marketed in dilutions representing 0.1 mg. of nitrogen per cc.: *Canary Dander Allergenic Extract-Lederle*[4]; *Chicken Feathers Allergenic Extract-Lederle*[4]; *Duck Feathers Allergenic Extract-Lederle*[4]; *Goose Feathers Allergenic Extract-Lederle*[4]; *Parrot Feathers Allergenic Extract-Lederle*[4]; *Pigeon Feathers Allergenic Extract-Lederle*[4]; *Turkey Feathers Allergenic Extract-Lederle.*[4]

Products marketed in dilutions representing 0.1 mg. and 0.01 mg. of nitrogen per cc.: *Brazil Nut Allergenic Extract-Lederle*[1]; *Cashew Nut Allergenic Extract-Lederle*[1]; *Chestnut (Spanish) Allergenic Extract-Lederle*[1]; *Coconut Allergenic Extract-Lederle*[1]; *Hazel Nut Allergenic Extract-Lederle*[1]; *Hickory Nut Allergenic Extract-Lederle*[1]; *Pecan Allergenic Extract-Lederle*[1]; *Pepper (Black) Allergenic Extract-Lederle*[9]; *Pepper (Red) Allergenic Extract-Lederle*[9]; *Pignolia Nut Allergenic Extract-Lederle*[1]; *Pistachio Nut Allergenic Extract-Lederle*[1]; *Walnut (Black) Allergenic Extract-Lederle*[1]; *Walnut (English) Allergenic Extract-Lederle.*[1]

Products marketed in dilutions representing 0.1 mg. and 0.001 mg. of nitrogen per cc.: *Caraway Seed Allergenic Extract-Lederle*[9]; *Lycopodium Allergenic Extract-Lederle*[7]; *Poppy Seed Allergenic Extract-Lederle.*[9]

Products marketed in dilutions representing 0.1, 0.01 and 0.001 mg. of nitrogen per cc.: *Camel Dander Allergenic Extract-Lederle*[4]; *Cuttlefish Allergenic Extract-Lederle*[4]; *Deer Dander Allergenic Extract-Lederle*[4]; *Hog Dander Allergenic Extract-Lederle.*[4]

Products marketed in dilutions representing 0.1 mg. and 0.00001 mg. of nitrogen per cc.: *Castor Bean Allergenic Extract-Lederle.*[12]

Products marketed in dilutions representing 0.05 mg. and 0.001 mg. of nitrogen per cc.: *Guinea Pig Dander Allergenic Extract-Lederle.*[4]

Products marketed in dilutions representing 0.01 mg. of nitrogen per cc.: *Ascaris Allergenic Extract-Lederle.*[3]

Products marketed in dilutions representing 0.01 mg. and 0.001 mg. of nitrogen per cc: *Mink Dander Allergenic Extract-Lederle*[4]; *Muskrat Dander Allergenic Extract-Lederle*[4]; *Raccoon Dander Allergenic Extract-Lederle.*[4]

Products marketed in dilutions representing 0.001 mg. of nitrogen per cc.: *Fox Dander Allergenic Extract-Lederle*[4]; *Mouse Dander Allergenic Extract-Lederle.*[4]

The methods used in preparing the extracts bearing numbers "1" to "10" are described under Allergenic Extracts-Lederle (New and Nonofficial Remedies, 1935, p. 29). The general method of extraction is also given in N. N. R. 1935.

The product marked "11" is prepared by the following method: The dried worms are ground and treated with toluol and ether until practically fat free. The residue is extracted with the buffered solution. The dialyzed extract is sterilized by Berkefeld filtration and standardized according to its nitrogen content.

The product marked "12" is prepared by the following method: The ground material is washed with toluol, alcohol and ether until practically oil free. The resulting residue is dried and extracted with the buffered solution. The extract is boiled for three minutes for detoxification. The coagulum formed is separated at once from the extract by filtration. The toxin free extract is sterilized by filtration and standardized on the basis of its nitrogen content.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION. FRANKLIN C. BING, Secretary.

HALE'S PRIDE VEG-ALL

Distributor.—Hale-Halsell Company, McAlester, Okla.

Manufacturer.—The Larsen Company, Green Bay, Wis.

Description.—Mixture of carrots, potatoes, celery, green beans, cabbage, peas, corn, lima beans, onions, sweet peppers, salt and water prepared by efficient methods for retention in high degree of the natural mineral and vitamin values; the same as the accepted "Larsen's Veg-All" (THE JOURNAL, Aug. 12, 1933, p. 525).

FORT HAMILTON BRAND PINEAPPLE JUICE

Distributor.—The E. H. Frechtling Company, Hamilton, Ohio.

Manufacturer.—Hawaiian Pineapple Company, Ltd., San Francisco.

Description.—Canned Hawaiian pineapple juice retaining in high degree the natural vitamin content; the same as Dole Hawaiian Finest Quality Pineapple Juice (Unsweetened) (THE JOURNAL, June 3, 1933, p. 1769).

REYNOLDS' STURGEON BAY BRAND PITTED RED CHERRIES WATER PACK—WITHOUT ADDED SUGAR

Manufacturer.—Reynolds Preserving Company, Sturgeon Bay, Wis.

Description.—Canned cooked red Wisconsin cherries packed in water without added sugar or salt. The same as Cellu Red Pitted Cherries Packed in Water Without Added Sugar or Salt (THE JOURNAL, Sept. 14, 1935, p. 885).

GOLD-PAK BRAND GRAPEFRUIT JUICE

Manufacturer.—Ariz-Sweet Grapefruit Growers, Ltd., Peoria, Ariz.

Description.—Canned Arizona grapefruit juice, retaining in high degree the original vitamin C content. The same as Ariz-Sweet Brand Grapefruit Juice, THE JOURNAL, April 25, 1936, page 1474.

GRIDLEY (FAST FROZEN) CHOCOLATE ICE CREAM

Manufacturer.—Gridley Dairy Company, Inc., Milwaukee.

Description.—Pasteurized, homogenized, chocolate flavored ice cream containing cream, evaporated milk, sugar, milk, cocoa, chocolate liquor, egg yolk, gelatin, vanilla extract and salt. Contains not less than 13 per cent milk fat. For description of manufacture see THE JOURNAL, Sept. 7, 1935, page 801.

ADVERTISING LEAFLET "PUBLICATIONS OF THE IRRADIATED EVAPORATED MILK INSTITUTE"

Sponsor.—Irradiated Evaporated Milk Institute, Chicago.

A leaflet which lists and describes the educational material available from the institute.

RECIPE LEAFLET "BEST OF FRIENDS ON BAKING DAY"

Sponsor.—Irradiated Evaporated Milk Institute, Chicago.

A leaflet intended for distribution through welfare groups. Includes recipes in which irradiated evaporated milk is used.

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SATURDAY, JULY 11, 1936

THE STRENGTH OF BONE

The several types of connective tissue are not greatly dissimilar when considered from the point of view of qualitative chemical composition. Tendon, cartilage and bone in the laboratory all yield essentially the same kind of compounds. The chemical difference between these tissues lies largely in the relative quantities of the characteristic substances constituting them. From each can be obtained collagen, mucoid and inorganic salts, but even the beginner in histochemistry is aware of the fact that the so-called ash constituents play a far more important part in the make-up of bone than they do in cartilage or tendon. This localization of inorganic salts in bone has long been considered the characteristic chemical feature of this tissue. Although the skeleton of the new-born mammal is more or less cartilaginous, the proportion of ash increases with age, under ordinary conditions of nutrition, until at maturity considerably more than half of the mass of the dry, fat-free bone consists of inorganic material. To add further significance to this reservoir of salts is the fact that almost the entire supply of the indispensable calcium of the body resides in the bones. It is reasonable therefore that, in considerations of the function, pathology and repair of bone, attention is focused primarily on this distinguishing aspect of its composition.

In the light of this emphasis, it is interesting to note in a recent report [1] the conclusion that under certain conditions the strength of bone depends more on the organic part of this tissue than on the degree to which the bone approaches the normal composition as regards the inorganic portion. In this study, groups of young rats were restricted for various periods to experimental rations extremely poor in mineral salts. At the end of this interval the breaking strength of the bone was correlated with the composition and with the measurements of length and two diameters. Although increase in body weight was largely suppressed by the dietary restriction imposed, there was appreciable increase in length and diameters of the representative bones examined. However, the strength of these bones was subnormal. Other groups of rats similarly treated were realimented with an adequate ration and the same tests made at stated intervals of refeeding. One group stunted for three weeks and refed for six weeks showed a definitely greater breaking strength than a second group stunted for six weeks and refed for twelve weeks. Further examination of the data shows that this difference in strength could not be correlated with the ash content of the respective bones but that, where the strength was greater, the measurements of the bone more closely approached those of the normal controls. It was apparent that the early period of restricted nutrition had adversely affected the architecture of the bone, as reflected in the measurements, to a degree somewhat proportional to the duration of the underfeeding. Likewise it appears that within limits "the breaking strength of a bone is more closely correlated with the integrity of the organic pattern as reflected in size than with the amount of inorganic matter deposited in the bone."

The studies described deal with dietary adjustments far more extreme than any likely to be encountered in practice. Nevertheless the results point definitely to the importance of serious consideration of the nonmineral part of the skeleton in certain situations. These observations will be of particular interest in the fields of orthopedics, surgery and dental pathology, in which not infrequently therapeutic emphasis involving oral adminstration of calcium salts seems somewhat misplaced.

1. Clarke, M. F.; Bassin, A. L., and Smith, A. H.: Am. J. Physiol. **115**: 556 (May) 1936.

BCG AS A TUBERCULOSIS PREVENTIVE

There are a number of reasons why the use of the living vaccine known as BCG, twelve years after its first use in France, should still be discussed and debated among those concerned with the prevention and cure of tuberculosis. It has never been conclusively demonstrated that the use of this vaccine is an effective means of preventing human tuberculosis. The reports of studies of its value as an effective vaccine in animals are greatly at variance despite the fact that these studies have been made by excellent investigators. The greatest value of BCG is in cattle but, in view of the variation in reported results, one could scarcely conclude that it is justifiable to use it universally in man. Those who have tried to produce a fixed virus without virulence, using a bile medium by the method of Calmette and Guérin, have failed to do so. Especially notable in this connection are the studies of A. Stanley Griffith [1] using seven bovine strains and exactly the method of the French scientists over a period of ten years. Yet he failed to alter the virus.

Since 1900 it has been well known that the injection of certain strains of tubercle bacilli raises the resistance

1. Griffith, A. S.: Lancet **1**: 303 (Feb. 6), 361 (Feb. 13) 1932.

of certain animals to a later killing dose of virulent tubercle bacilli. But the vaccination of man with living tubercle bacilli had never been seriously proposed until 1922, when Professor Calmette enthusiastically suggested it and French physicians began to practice it. This enthusiasm was not shared by British and American physicians primarily because the determination as to whether it should be used in commerce was in Great Britain in the hands of the Medical Research Council and in the United States in the hands of the National Institute of Health (U. S. Public Health Service) and the Bureau of Animal Industry (Department of Agriculture), which are government agencies. Their conservatism was based on the premise that the ability of the vaccine to justify the claims of the French scientists should be proved by animal tests before employing it wholesale in man.

The enthusiasm with which the French scientists advocated their prophylactic vaccine received a severe blow from the American and British point of view when Prof. Major Greenwood [2] in England criticized the methods of statistical study that were used by Calmette to prove the value of his vaccine. There is still a great tendency to base conclusions on empirical observations rather than on rigid scientific technic in human epidemiologic studies, in which it is so difficult and so important to provide comparable controls.

The method of administering the vaccine has changed three times in this period. Administration by mouth in the early days of life was first advocated. This apparently is gradually disappearing as a method of election. The next method was administration by subcutaneous injection. This was so frequently followed by "cold abscesses" that this also is gradually giving place to the method of intracutaneous injection. Experiments in animals have shown little value for the oral method as a means of prevention. The subcutaneous method and the intracutaneous method are variable in their results in animals. The intravenous method [3] of vaccination has proved to be the most efficacious in cattle, although this also varies within wide limits. The greatest difficulty has been to determine how long the period of increased resistance lasts. This also apparently varies in many instances and is often of short duration; that is, under one year.

Many different cultures of BCG have been sent to the United States in the hands of various persons, laymen and physicians alike. Different workers have used cultures obtained at different times from the French laboratories. The result is variation in the experimental work that has been carried on, for little has been done to check the constancy of the characteristics of these strains. When the matter of human use first required attention in the United States, Dr. G. W. McCoy, director of the National Institute of Health, conferred with Dr. Theobald Smith, Dr. William H. Park, Dr. Eugene L. Opie and Dr. William Charles White. It was agreed that Dr. Park and Dr. Opie should undertake to use the vaccine (with the consent of parents) in children in the United States with as careful control conditions as possible. These studies were undertaken with the approval of Dr. McCoy. One study [4] was carried on from the Department of Health of New York City and the other [5] from the Henry Phipps Institute in Philadelphia. The results of these studies have been published from time to time. They are among the best attempts in the world at adequate control comparisons, but one can only conclude, after studying them, that they do not provide conclusive evidence for general use of the vaccine.

It is not the purpose here to analyze the experiments by various persons in different countries but rather to offer certain conclusions based on a careful study of the data and a familiarity with several of the experiments in different countries. The whole subject has been fairly reviewed by K. Neville Irvine.[6] It may be concluded that:

1. Practically all strains of BCG used in children have been avirulent. (Nothing has been said of the Lübeck disaster, as this was proved to be a laboratory accident.)

2. It has been proved that there is a definite increase in the resistance of cattle by the use of this vaccine, although it varies within wide limits and the duration of the increased resistance also varies within wide limits.

3. The evidence of increased resistance produced by this vaccine in many other species of animals is not very convincing.

4. The oral method, if one is to judge by animal experiments, is not efficient.

5. One is not justified in taking the animal experiments, even those in cattle, as a reason for universal vaccination in man.

Sufficient arguments can however be presented for the use of this vaccine in groups for which little can be done by other methods, as for example the Negroes in the South and the Indians on the reservations, where the present machinery is not adequate in view of the peculiar circumstances surrounding their condition. It would be possible, under conditions in which a high death rate prevails, over a period of twenty years to determine something of the value of BCG and also to add to our knowledge. That there is no conclusive proof of the efficacy of the vaccine in man is in part due to the short duration of the experiments and to the small number of those involved in the carefully controlled experiments as well as to the inadequacy of the accurate data on the control groups.

2. Greenwood, Major: Brit. M. J. **1**: 793 (May 12) 1928.
3. Buxton, J. B., and Griffith, A. S.: Lancet **1**: 393 (Feb. 21) 1931.
4. Kereszturi, Camille; Park, W. H.; Vogel, P., and Levine, M.: Fate of Children of Tuberculous Families, Including Those Treated and Those Not Treated with BCG, Am. J. Dis. Child. **48**: 507 (Sept.) 1934.
5. Aronson, J. D., and Dannenberg, A. M.: Effect of Vaccination with BCG on Tuberculosis in Infancy and in Childhood, Am. J. Dis. Child. **50**: 1117 (Nov.) 1935.
6. Irvine, K. N.: The BCG Vaccine, Oxford University Press, London, Humphrey Milford, 1934.

Current Comment

THE INHERITANCE OF ESSENTIAL PENTOSURIA

There are at least two well know types of chronic essential pentosuria, differing from each other in the nature of the pentose excreted. A simple test allows the easy identification of *l*-xyloketose in the urine and thus the positive diagnosis of this type of pentosuria. In a recent study of forty-one such cases, Lasker and her collaborators [1] believe that they obtained evidence which strongly indicates that xyloketosuria is inherited as a recessive characteristic. Twenty pentosuric families were observed. The accepted methods of plotting the cases occurring in families were followed, and four factors indicated that the inheritance of this abnormality is probably controlled by a single recessive gene. Thus, although xyloketosuria is rare in the general population, it is frequently found in families in which known cases exist. Most of the patients with pentosuria were Jews, a fact which strongly supports the contention that the disease is hereditary. The disease was found present in the children of ten families in which neither parent showed evidence of the disease. Hence, if inherited, the abnormality would almost certainly be recessive in character. Finally, one case was observed in a child born to cousins. The likelihood of members of her generation in this family showing the trait was especially great if xyloketosuria is to be considered as a recessively inherited abnormality, both because one parent had the disease and because the parents were related to each other. The authors further state that causes other than heredity may apparently produce pentosuria. They believe it possible, however, that where such causes are operative the pentosuria may have been overlooked and was not discovered until after the event that was believed to have led to its occurrence.

1. Lasker, Margaret; Enklewitz, Morris, and Lasker, G. W.: The Inheritance of l-Xyloketosuria (Essential Pentosuria), Human Biology **8**: 243 (May) 1936.

SELENIUM CONTENT IN WHEAT

In previous comments on the possible dangers of selenium poisoning [1] it has been pointed out that selenium in the soil is most likely to reach toxic concentrations in semiarid regions, those which furnish the great wheat fields of the world. Robinson [2] has recently investigated the problem further by analyzing the selenium content of wheat grown in various parts of the world. Early in the investigations it was found that nearly all the selenium present in the grain could be concentrated in the gluten fraction of the wheat. The estimation of exceedingly small quantities of selenium was difficult and the final results used therefore were the mean of duplicate and frequently triplicate analyses. A variation in the selenium content of commercially purchased wheat of from 0.1 to 1.9 parts per million was found. All wheats contain some selenium. It is improbable, according to Robinson, that any field grown wheat is entirely free from that element. The Canadian wheat and the South African wheat, with selenium contents of between 1 and 2 parts per million, show that there are soils in other countries which contain considerable quantities of this element. The presence of small amounts of selenium in random selections of commercially obtained wheat does not eliminate the possibility that there are areas represented in the mixed sample which may produce wheat with a sufficiently large content to be toxic. Thus wheat from a small plot in a larger field in Wyoming contained 2.7 parts of selenium per million, and a toxic wheat from a small plot in a larger field in South Dakota contained 26 parts per million. No work was done on the relation between selenium and the flour milled from the wheat. Since the gluten of the wheat carries most of the selenium, the examination for selenium of the glutens proposed for special diets becomes especially interesting, since presumably the dry-land wheats would be used for gluten extractions. Of two such samples of gluten examined, one contained 0.8 part of selenium per million and the other 16 parts per million. A gluten purchased in New York contained 12 parts per million. The gluten raised by Hurd-Karrer on artificially selenized soils contained 340 parts of selenium per million. A gluten of this selenium content and the gluten separated from the toxic field grown wheat would be dangerous to use, and one containing 16 parts per million could hardly be considered wholesome.

1. Toxic Effects of Selenium, Current Comment, J. A. M. A. **106**: 926 (March 14) 1936; The Selenium Problem, editorial, ibid. **104**: 50 (Jan. 5) 1935.

2. Robinson, W. O.: Selenium Content of Wheat from Various Parts of the World, Indust. & Engin. Chem. **28**: 736 (June) 1936.

MONOCYTES IN AGRANULOCYTOSIS

Rosenthal and Abel [1] believe that they can differentiate three main types of agranulocytosis at the onset of symptoms according to the predominance of certain cells. The first type is that with relative lymphocytosis; the second, agranulocytosis with unusual monocytosis (leukopenic infectious monocytosis), and the third, hypoleukocytic angina in which all the symptoms of agranulocytosis are present, including leukopenia, but without much change in the differential blood count. They now report fourteen more cases of agranulocytosis with monocytosis and attempt to show the possible relation of this form of the disease to the administration of drugs. The majority of their cases began like infections, with malaise, chilliness, weakness and anorexia. Soreness of the tongue and gums, often with ulcerations, was not infrequently observed. Cervical lymphadenopathy was present in three instances. The etiologic factors of the disease are uncertain, though it has been suggested that abnormal disturbances of the bone marrow, unusual septic processes, or the influence of drugs is largely responsible. History of drug taking was elicited prior to the onset of symptoms in nine of the fourteen cases reported. It was interesting to note, however, that in one case a preparation containing barbituric acid derivative and aminopyrine was given on six different occasions during the acute stage of the disorder but seemed to have had no influence on the favorable progress of the disease. The most striking hematologic feature of the cases reported was not only the relative increase in the percentage of monocytes but

1. Rosenthal, Nathan, and Abel, H. A.: The Significance of the Monocytes in Agranulocytosis (Leukopenic Infectious Monocytosis), Am. J. Clin. Path. **6**: 205 (May) 1936.

in several instances an actual absolute increase. The authors believe that the prognosis is more favorable in agranulocytosis accompanied by monocytosis than in other forms of the disease. In their total group of twenty-two patients so far observed, seventeen have recovered, a percentage of 77. Treatment other than local applications when indicated was unnecessary in the mild cases, although in more severe ones the patients received either pentose nucleotide or liver extract intramuscularly or intravenously.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Personal.—Dr. William J. Donald, Lafayette, has been named health officer of Baldwin County, effective July 1, to succeed Dr. Stephen A. Durick, Bay Minette, who has resigned to enter private practice.——Dr. Joseph J. Repa, Cresson, Pa., has been added to the Alabama State Department of Health as full time pediatrician.——Dr. Charles J. Fisher, Moulton, has been appointed health officer of Lawrence County.

Pediatric Meeting.—Dr. Wallace A. Clyde, Fairfield, was elected president of the Alabama Pediatric Society at its eleventh annual session in Montgomery recently. Other officers are Drs. Jacques H. Baumhauer, Mobile, vice president, and Martin G. Neely, Fairfield, secretary. Speakers at the meeting included:

Dr. Daniel Lesesne Smith Sr., Spartanburg, S. C., Upper Respiratory Infections.
Dr. Samuel F. Ravenel, Greensboro, N. C., Experiences with Nephritis in Children.
Dr. Owen H. Wilson, Nashville, Vomiting in Young Babies, with Special Reference to Pyloric Stenosis.
Major Houston H. Parsons, Fort McClellan, Mumps.
Dr. John Signorelli, New Orleans, Eczema from the Pediatrician's Standpoint.

ARIZONA

Dr. **Wyatt Receives the Stacey Award.**—Dr. Bernard L. Wyatt, formerly director of the Desert Sanatorium and Institute of Research, Tucson, has received the James E. Stacey Award for 1936 awarded by the University of Cincinnati College of Medicine. The award consists of a medal and an honorarium of $100 and is given for significant contribution in the field of focal infection. Dr. Wyatt graduated from New York University and Bellevue Hospital Medical College in 1905, and for a time was medical officer of health of the district of Abaco, Bahama Islands.

ARKANSAS

Society News.—At a meeting of the Southeast Arkansas Medical Society in Lake Village, recently, Dr. Joseph F. Shuffield, Little Rock, gave a lantern demonstration on fractures, and Dr. Guy C. Jarratt, Vicksburg, read a paper on "Pyuria in Children."——At a meeting of the Ouachita County Medical Society in Camden, May 7, a motion picture on "Treatment of Burns," furnished by Dr. Grover C. Penberthy, Detroit, was shown.——Dr. Lee Vallette Parmley, Little Rock, gave his presidential address at the spring meeting of the First Councilor District Medical Society in Tyronza, June 18, on "The Trend of Medical Legislation." Other speakers included Drs. Rufus C. Shanlever, Jonesboro, on "Diagnosis of Acute Diseases of the Abdomen"; Robert T. Nowlin, Memphis, "Importance of Pain as a Symptom in Disease," and Charles S. Holt, Fort Smith, "Surgery in Tuberculosis."

CONNECTICUT

Personal.—Dr. Benjamin G. Horning has been named superintendent of the Hartford board of health.——Dr. James C. Fox Jr., associate clinical professor, Yale University School of Medicine, New Haven, has been appointed clinical professor of neurology, effective July 1.

DISTRICT OF COLUMBIA

Rocky Mountain Spotted Fever.—Two children have been treated for Rocky Mountain spotted fever at Children's Hospital, Washington, it was reported June 9. One child was from near Upper Marlboro, Md., and the other from Chevy Chase. Thirty-nine cases have been reported in the district since 1931, with thirteen deaths. While there is no cause for alarm, it is pointed out that, in certain sparsely built up sections in the district, ticks are prevalent and may infect one with the fever. Five of the persons reported ill in the district had not been out of the city.

Personal.—Miss Clara Dutton Noyes, national director of the American Red Cross Nursing Service, died in Washington, June 3, aged 66. Miss Noyes graduated from the Johns Hopkins School of Nursing in 1896 and before the World War served as superintendent of nurses at Bellevue Hospital, New York, and Johns Hopkins Hospital, Baltimore.——Clinton T. Messner, D.D.S., chief of the dental department, U. S. Public Health Service, since 1924, died in Washington, May 28. A native of Oxford, Ind., Dr. Messner served in the army medical corps during the World War.——Dr. Alice Hamilton, Boston, technical adviser on industrial poisons, U. S. Department of Labor, was presented with the national achievement award of the Chi Omega Sorority, June 22.——The honorary degree of doctor of science was conferred on Major General Charles R. Reynolds, U. S. Army, by Dickinson College, Carlisle, Pa., at its recent commencement.

GEORGIA

Additions to Staff of Health Department.—Dr. Edmund S. Burwell has been appointed associate clinician in the division of tuberculosis control, Georgia State Department of Health, Atlanta. Dr. Samuel Ross Brown, recently of the U. S. Veterans' Hospital, Muskogee, Okla., will assist in the bureau of venereal disease control. Dr. Fritz A. Brink, Jacksonville, Fla., has been appointed district health officer with headquarters in Blackshear. Dr. David M. Wolfe, Augusta, has been appointed assistant chief of the division of epidemiology.

Chattahoochee Valley Meeting.—The thirty-sixth annual session of the Chattahoochee Valley Medical Association will be held at Radium Springs, July 14-15. The following will be included among the speakers:

Dr. James P. Collier, Tuscaloosa, Ala., Acute Appendicitis.
Dr. Thomas R. Littlejohn, Sumter, S. C., Cardiovascular Syphilis; An Elementary Study.
Dr. Seale Harris, Birmingham, Pituitary, Thyroid, Adrenal, Hepatogenous and Pancreatic Diabetes Mellitus.
Dr. Arthur Mazyck Jr., Dothan, Ala., Carbohydrate Intolerance.
Dr. James M. Bryant, Jacksonville, Fla., Early Diagnosis of Carcinoma of the Cervix Uteri.

A symposium on public health will be held Wednesday morning by Drs. James N. Baker, Montgomery, state health officer of Alabama; Thomas F. Sellers, chief of laboratories, department of public health, Atlanta; Wilbur A. McPhaul, Jacksonville, state health officer of Florida, and Dr. Joseph Yampolsky, Atlanta. Dr. Marye Y. Dabney, Birmingham, will deliver the W. J. Love Memorial Address, Wednesday afternoon, on "The More Useful Procedures in Present Day Gynecology." The session will be concluded with addresses by Drs. Orion O. Feaster, St. Petersburg, and Benjamin H. Minchew, Waycross, presidents, respectively, of the Florida and Georgia medical associations.

ILLINOIS

Rabid Dogs.—The state health department has issued a bulletin asking the cooperation of the public in the proper handling of emergencies involving the risk of rabies. The department reports that during the week June 14-20 twenty-six animal heads from seventeen counties were sent to the diagnostic laboratories of the state health department for examination, and during the same period vaccine for giving the Pasteur antirabic treatment to 131 persons in twenty-four counties was sent out by the department. Up to June 30, 373 heads had been examined by the department laboratories this year, vaccine sufficient to treat 1,353 persons had been distributed, and 4,374 cases of dog bite wounds had been reported.

Chicago

Report of Behavior Clinic.—There were 1,374 cases referred for examination to the behavior clinic of the criminal court of Cook County during the first five years of its existence, according to a recent report. Of this number, 1,268 received complete psychiatric, psychologic and physical examinations and intensive social service investigation; six were given only physical examinations on order of the judge; sixty-four refused examination or were discharged before a complete examination

could be made; thirty-six were short-service cases; that is, they were transferred to the psychiatrist at the House of Correction or sent to some other clinic. There were 199 patients, or 15.6 per cent, who were found to be actively psychotic and were committed to hospitals for mental disease; 122, or 9.6 per cent, were found to be so mentally defective that commitment to an institution for the feebleminded was warranted; an additional 7 per cent were mentally defective (borderline) but not sufficiently so for commitment; 192, or 15.1 per cent, were found to be suffering from some mental or nervous disorder or personality defect but not serious enough to warrant commitment by the court to a hospital for mental diseases. In most of these cases treatment was recommended; 661 patients, or 52 per cent, showed no evidence of organic or functional nervous or mental disease or feeblemindedness. Under the classification "Psychoses," dementia praecox led the list of diagnoses with a total of sixty; the paranoid state was second with forty-one, and alcoholic psychosis third with twenty. Although it was intended that examinations by the behavior clinic be made after a person was convicted of a crime but not yet sentenced, the majority of cases have been referred after indictment but before conviction.

INDIANA

Hospital News.—The dedication of a new $50,000 health preventorium at the Julia Jameson nutrition camp, Bridgeport, took place June 21. The building was made possible through special gifts from individuals and organizations to the Marion County Tuberculosis Association. The camp, which is operated by the tuberculosis association, opened with seventy-five children enrolled.——The medical library of the late Dr. Bud Van Sweringen, Fort Wayne, has been given to the Methodist Hospital, Fort Wayne, by Mrs. Van Sweringen in memory of her husband.——As a memorial to physicians who have served in the Indianapolis City Hospital, a lane of elm trees has been started on the hospital grounds by the woman's auxiliary of the Indianapolis Medical Society. This lane is a part of the memorial park surrounding the hospital which has been dedicated to physicians who have gratuitously cared for patients unable to pay. It connects the city hospital with the James Whitcomb Riley Hospital for Children and other hospitals of the Indiana University Medical Center (THE JOURNAL, July 8, 1933, p. 146).

KANSAS

Activities of State Board of Health.—County medical societies will be asked to establish liaison committees to serve with the state board of health, according to the state medical journal, to aid in the further coordination of the board's activities. The state board recently established a district laboratory to serve southeast Kansas, which will occupy space in the Parsons State Hospital. Raymond E. Leach is the bacteriologist in charge.

Veteran Physicians Honored.—Dr. Arthur J. Anderson, Lawrence, was guest of honor at a dinner meeting of the Douglas County Medical Society in Lawrence, May 7, in celebration of his completion of fifty years in the practice of medicine. He was presented with a silver plaque. Judge Hugh Means, spoke on "Some Medical-Legal Aspects of Practice." Dr. Charles M. Stemen, Kansas City, was guest of honor at a similar celebration, May 26, held by the Wyandotte County Medical Society; the occasion was a dinner dance.

KENTUCKY

Alumni Reunion at Louisville.—The University of Louisville School of Medicine conducted a two-day clinical course for alumni June 8-9. There were symposiums by the faculty on nephritis, management of injuries, the blood and hormones of the anterior pituitary. The bacteriologic and serologic laboratories of the Louisville City Hospital, which are affiliated with the school of medicine, also held open house during the two days. The second day's sessions were a "house warming" for a new annex to the medical school. The alumni banquet was held at the Brown Hotel Monday evening June 8, with Dr. William Barnett Owen as toastmaster. Dr. John Walker Moore, dean of the school of medicine, was chairman of the committee in charge of clinics.

Society News.—Drs. Charles B. Billington, Wickliffe, and John F. Dunn, Arlington, addressed the Tri-County Medical Society (Hickman, Ballard and Carlisle counties), on hypertension and acute infection of the middle ear, respectively.——Dr. George E. Rockwell, Cincinnati, addressed the Harrison County Medical Society, Cynthiana, June 1, on "Allergy as Seen by General Practitioners."——Dr. Frank T. Linton, Princeton, was elected president of the Southwestern Kentucky Medical Association at its annual meeting in Paducah, May 19.——Dr. Walter Dean, Louisville, was elected president of the eye, ear, nose and throat section of the Kentucky State Medical Association at the annual meeting of the section in Louisville, May 22, succeeding Dr. Frank C. Thomas, Lexington.

MASSACHUSETTS

Personal.—Dr. John L. Jacobs, New York, has been appointed associate professor of pathology and bacteriology at Tufts College Medical School, Boston, effective July 1, it is reported.——Dr. Vincent P. Cummings has been appointed city physician of North Adams to succeed Dr. William F. McGrath.

Society News.—Dr. Kurt E. J. Lande, New York, discussed "Forensic Medicine in Europe, Legal Medicine in America" before the Harvard Medical School, May 21.——Dr. Louis E. Phaneuf, Boston, discussed "Pelvic Infection in Women" before the South End Medical Club, Boston, June 16.——Recently elected officers of the New England Physical Therapy Society are Drs. Claude L. Payzant, Boston, president; George B. Carr, Lynn, and Chester S. Leach, Brattleboro, Vt., vice presidents, and William D. McFee, Boston, secretary.

MICHIGAN

Personal.—The honorary degree of doctor of science was conferred on Dr. Roy D. McClure, Detroit, by Ohio State University, Columbus, June 15.——Dr. Walter J. Cree was given the honorary degree of master of science at the annual commencement exercises of Wayne University, Detroit, June 18.

Bureau of Information.—The organization of a bureau of information by the public relations committee of the Michigan State Medical Society is under way, according to a recent announcement. It was pointed out that the work of the bureau will eventually necessitate the creation of speakers' bureaus in all county medical societies, bringing the physician in closer contact with the public.

Canfield Memorial Lecture.—Four hundred dollars has been given to the board of regents of the University of Michigan School of Medicine by Phi Rho Sigma fraternity as the nucleus for a memorial lectureship fund in honor of the late Dr. Roy B. Canfield, professor of otolaryngology at the school. The fraternity expects to add other donations from time to time. When the principal reaches such a sum that the annual income from it, in the opinion of the medical faculty and of the president and regents, will serve as an appropriate honorarium to the person or persons chosen to give the lecture, the Dr. Roy Bishop Canfield Memorial Lecture will be inaugurated.

Changes at the Medical School.—Elizabeth C. Crosby, Ph.D., has been promoted to professor of anatomy in the University of Michigan School of Medicine, Ann Arbor, and Dr. Erwin E. Nelson, to professor of pharmacology. Other changes include:

Charles R. Brassfield, M. S., to assistant professor of physiology.
Dr. Frank Hartsuff Bethell, assistant professor of internal medicine.
Dr. Stanley M. Goldhamer, assistant professor of internal medicine.
Dr. Franklin Davis Johnston, assistant professor of internal medicine.
Dr. Don Marshall, assistant professor of surgery.
Dr. Luis Yglesias, assistant professor of surgery.

The Edward Swift Dunster Scholarship has been made available at the medical school. The interest from a fund of $1,500 will be used for the scholarship, which is named in honor of the late Dr. Dunster, who was for many years a professor in the medical school. Dr. Dunster died in 1888. Dr. Max M. Peet, professor of surgery at Michigan, was honored in May when a bird, Botaurus lentiginosus-peeti, a variety of American bittern, was named for him. Dr. Peet has been a student of ornithology for thirty years and possesses a fine collection, the *University Hospital Bulletin* reports.

MINNESOTA

Personal.—Dr. Charles H. Mayo, Rochester, has been named professor emeritus of surgery of the medical and graduate schools, University of Minnesota.——Dr. James R. Kingston, Deer River, has been appointed health officer of the northern district of Minnesota, with headquarters in Bemidji. The district is composed of Koochiching, Itasca, Hubbard and Beltrami counties.

Georgopoulos Sentenced for Illegal Practice.—George D. Georgopoulos pleaded guilty to practicing healing without a basic science certificate in municipal court, Faribault, May 16, and was sentenced to pay a fine of $500 and costs or serve six months in the Rice County jail. He was unable to pay the fine and was placed in jail. The defendant had examined and treated a tuberculous patient at Faribault and received $20. In

his room in St. Paul, a trunk was found full of medicine and medical instruments. When arrested he stated he had a license but produced instead two diplomas bearing the name Reliable Laboratories, St. Paul, Minn. One of the diplomas was in hematology and urinalysis and the other in physical therapy. Georgopoulos stated that the school was operated by one Philip Stern in the Pittsburgh Building, St. Paul. He claimed he attended a course for two months to secure the diploma in hematology and urinalysis, for which he paid $140; he went another month to get the diploma in physical therapy, for which he paid $15. He admitted having treated several patients, his fees ranging from $2 to $10 for each patient. He was arrested in St. Paul in 1929 for a similar offense, at which time he pleaded guilty and paid a fine of $250. Subsequently in federal court he was denied citizenship because of his unlawful practice of medicine.

MISSISSIPPI

Personal.—Dr. Cecil C. Smith, Indianola, formerly director of the Sunflower County Health Department, has been placed in charge of the Pearl River County Health Department, Poplarville; he has recently returned from a year's study at Johns Hopkins School of Hygiene and Public Health, Baltimore, where he received the certificate in public health.

Society News.—Dr. Willard H. Parsons, Vicksburg, addressed the East Mississippi Medical Society in Philadelphia, June 18, on "Reduction of Surgical Mortality."——The George County Medical Unit was reorganized at a meeting, April 7, and application for a charter filed. Speakers at a meeting, June 5, were Drs. James A. Dorsett and Jack L. Spiceland, Lucedale, on "Proper Use of Anesthesia in Labor" and "Tannic Acid Treatment of Burns" respectively.——Dr. Robert E. Wilson, Greenville, addressed the Issaquena-Sharkey-Warren Counties Medical Society in Vicksburg, June 10, on "Erysipelas in Children."

NEVADA

Plague-Infected Ground Squirrels.—Plague infection has been identified in ground squirrels shot on a sheep ranch near Lamoille in Elko County recently, the U. S. Public Health Service reports. The infection was determined by inoculating guinea-pigs with fleas removed from fifty ground squirrels. It was said that previous examinations of hundreds of squirrels had not revealed any suggestive lesions.

NEW HAMPSHIRE

Veteran Physicians Honored.—At the recent annual meeting of the New Hampshire Medical Society Dr. Ellen A. Wallace, Manchester, received a gold medal in recognition of her membership in the society for fifty years. At the same time honor was paid to Drs. Frederick L. Hawkins, Meredith, and John F. Robinson, Manchester, who have been in practice fifty years.

Society News.—Dr. Benjamin P. Burpee, Manchester, discussed obstetrics before the Strafford County Medical Society, Rochester, in April.——Drs. Clifford L. Derick, Boston, and Elmer J. Brown, Manchester, addressed the Hillsborough County Medical Society, Nashua, April 28, on "Staphylococcus Infections and Their Treatment" and "Medical and Surgical Treatment of Prostatism" respectively.

NEW JERSEY

Personal.—Dr. Ellen C. Potter, director of medicine of the New Jersey Department of Institutions and Agencies, received the honorary degree of doctor of laws at the annual commencement of the New Jersey College for Women, New Brunswick, June 6.

State Medical Election.—Dr. Spencer T. Snedecor, Hackensack, was chosen president-elect of the Medical Society of New Jersey at the annual meeting in Atlantic City, June 3. Dr. Francis R. Haussling, Newark, was installed as president; Drs. William G. Herrman, Asbury Park, and William J. Carrington, Atlantic City, were elected vice presidents and Dr. John B. Morrison, Newark, reelected secretary.

NEW YORK

Personal.—Dr. Joseph Frederick Painton, Buffalo, has been appointed associate in medicine at the University of Buffalo School of Medicine.——Dr. Max J. Schwerd, Staten Island, was guest of honor at the annual dinner of the Richmond County Medical Society in April, celebrating his fiftieth anniversary in the practice of medicine.——Dr. Hickson Field Hart, Peekskill, celebrated the fiftieth anniversary of his graduation from the College of Physicians and Surgeons, New York, May 13.

Hospital News.—The name of Bloomingdale Hospital, White Plains, which is affiliated with New York Hospital, New York, has been changed to New York Hospital, Westchester Division. The Westchester institution has been conducted by the Society of the New York Hospital since 1821. Dr. Clarence O. Cheney, formerly director of the New York State Psychiatric Institute, New York, was recently appointed medical director (THE JOURNAL, March 14, p. 929).——Dr. Hobart A. Burch, Rochester, Minn., has been appointed director of the x-ray department of St. Joseph's Hospital, Elmira.

Board of Psychiatric Examiners.—Under the provisions of a law passed by the 1936 legislature establishing a board of qualified examiners in the state department of mental hygiene, the following have been appointed to constitute the board: Drs. Frederick W. Parsons, commissioner of mental hygiene; Vernon C. Branham, Woodbourne, appointed by the commissioner of correction; Lloyd H. Ziegler, Delmar, appointed by the superintendent of education, and Israel Strauss, New York, selected by the Medical Society of the State of New York. The code of criminal procedure has been amended to require that courts appointing a commission to examine persons charged with crime include at least one qualified psychiatrist.

New York City

Deaths from Alcoholism Decrease.—A compilation of deaths from alcoholism reported to the New York City Department of Health since 1931 shows that these deaths have decreased in the past five years. In 1931 there were 794 deaths; 1932, 574; 1933, 666; 1934, 596, and 1935, 509. There has also been a sharp decrease in the number of deaths and serious illness from alcohol poisoning, the report said.

Personal.—Dr. Herbert C. Chase has been appointed professor of surgery at New York Polyclinic Medical School and Hospital.——Dr. Stephen P. Jewett, clinical professor of psychiatry, New York Medical College and Flower Hospital, has been appointed director of the neurologic division of Metropolitan Hospital.——The Society of Alumni of Bellevue Hospital celebrated its fiftieth anniversary recently and presented a watch and chain to Dr. Leroy W. Hubbard, Mount Vernon, N. Y., sole survivor of the nineteen founders.——Dr. Howard Fox was recently elected an honorary member of the Austrian Dermatologic Society.

Changes at New York University.—Dr. Harold D. Senior, professor of anatomy and director of the anatomic laboratories at New York University College of Medicine since 1910, has been made professor emeritus. The college announces the appointment of Dr. Frederic Wertham as assistant clinical professor of psychiatry, effective in September. Dr. Irving Graef has been promoted to be associate professor of pathology; Drs. Lauretta Bender and Nathaniel Ross, assistant clinical professors of psychiatry, and Walter Bromberg, assistant clinical professor of psychiatry, all effective in September. In recent months Drs. Albert A. Epstein, Isidore W. Held and Thomas A. Martin have been appointed clinical professors of medicine and Dr. Karl M. Bowman professor of clinical psychiatry. In addition, the following promotions have been made:

Dr. Harrison S. Martland, professor of forensic medicine.
Dr. Howard C. Taylor Jr., associate professor of obstetrics and gynecology.
Dr. William Bierman, assistant clinical professor of therapeutics.
Drs. Anthony S. Bogatko, Victor Carabba, Thomas J. Galvin, Francis M. Harrison, John H. Mulholland, Joseph Nash, John Nelson, Harry A. D. O'Connor, Samuel Standard and Hippolyte M. Wertheim, assistant clinical professors of surgery.

Ninth Graduate Fortnight.—The subject of the ninth annual Graduate Fortnight of the New York Academy of Medicine, to be presented October 19-31, will be "Trauma, Occupational Diseases and Hazards." Twenty-two hospitals will offer coordinated afternoon clinics and clinical demonstrations, and evening sessions will be held at the academy. Among speakers who will address the evening sessions are:

Dr. Henry E. Sigerist, Baltimore, Historical Background.
Dr. John J. Moorhead, Accidents and Their Management.
Dr. Marvin A. Stevens, Hazards in Athletics.
Dr. Foster Kennedy, Fatigue and Noise in Industry.
Drs. Henry H. M. Lyle, New York, Harry L. Gilchrist, Washington, D. C., and Col. Adelno Gibson, U. S. Army, Governors Island, N. Y., War Injuries and Emergencies.
Dr. William Darrach, General Principles of Fracture Treatment.
Alexander O. Gettler, Ph.D., Toxicology of Industrial Poisonings.
Dr. Alice Hamilton, Boston, Medicolegal Aspects of Industrial Poisonings.
Dr. Temple S. Fay, Philadelphia, Injuries to the Head.
Dr. Byron P. Stookey, Injuries to the Spine.

A scientific exhibit of books, pathologic and research material, apparatus for resuscitation and other first aid appliances will be assembled and demonstrations will be held at regular intervals.

NORTH DAKOTA

Hospital News.—A new seven story building is being erected at the North Dakota State Hospital, Jamestown, according to the *American Journal of Psychiatry*. The building, which will furnish infirmary care and treatment for 450 patients, will cost $360,000, part of which is supplied by the federal government and the remainder by the state.

OHIO

Personal.—Dr. Will M. Hoyt, Hillsboro, has been appointed health officer of Highland County.——Dr. Burrell Russell, New Philadelphia, has been appointed a member of the board of trustees of Ohio State University, Columbus.——Dr. Henry P. Worstell, Columbus, has been appointed orthopedic consultant to the medical division of the state industrial commission.——Dr. Archie J. Martin, who recently completed his internship at the Ohio Valley General Hospital, Wheeling, W. Va., has been appointed health commissioner of Belmont County.——Dr. Chester W. Waggoner, Toledo, has been appointed to the state medical board for a term of seven years. He succeeds Dr. James G. Blower, Akron.

Society News.—Dr. Murat H. Cherrington, Logan, spoke on epidemic encephalitis at a meeting of the Hocking County Medical Society, Logan, May 14.——Dr. Edward H. Wilson, Columbus, addressed the Hempstead Academy of Medicine, Portsmouth, May 11, on "Nonunion of Fractures."——Dr. Harley O. Bratton, Columbus, addressed the Morrow County Medical Society, Mount Gilead, May 12, on "Medical and Surgical Treatment of Prostatic Hypertrophy."——Dr. John E. Greiwe, Cincinnati, addressed the Warren County Medical Society, Lebanon, on "The Electrocardiogram and the Coronary Circulation."——Dr. George I. Nelson, Columbus, discussed treatment of heart failure as the guest of the Auglaize County Medical Society, Wapakoneta, June 11.——Dr. Louis Mark, Columbus, addressed a joint meeting of the Miami and Shelby county medical societies at Sidney, June 4, on "The Modern Trend in Treatment in Tuberculosis."——The Stark County Medical Society recently began publication of a quarterly bulletin.——Dr. Charles C. Wolferth, Philadelphia, addressed the Mahoning County Medical Society, Youngstown, June 16, on cardiovascular disease.

OREGON

Society News.—Drs. Edward C. Bull and LeRoy H. Briggs, San Francisco, were guest speakers before the Southern Oregon Medical Society at its annual meeting at Klamath Falls in May, on "Fracture of the Tibia and Fibula Involving the Ankle Joint" and "Nonpulmonary Tuberculosis" respectively. Dr. Elza D. Johnson, Klamath Falls, president of the society, gave his official address on "The Ancient Art of Prescription Writing."

PENNSYLVANIA

Hospital News.—The state department of welfare is making a census of county mental hospitals to supplement data on state-owned institutions.

Cancer Meeting.—The Cambria County Medical Society held an all day cancer meeting for physicians and the public in Johnstown June 11. Speakers were Drs. George E. Pfahler, Philadelphia; Edwin A. Merritt, Washington, D. C.; William F. MacFee, New York; Samuel J. Waterworth, Clearfield; Walter M. Bortz, Greensburg, and George W. Grier, Pittsburgh. Drs. Laurrie D. Sargent, Washington, district councilor, and Alexander H. Colwell, Pittsburgh, president of the Medical Society of the State of Pennsylvania, also appeared on the program.

Philadelphia

Hospital News.—The Preston Retreat celebrated the centenary of its chartering, June 14. The building was completed in 1840, but lack of income prevented it from opening until 1865. Dr. John Cooke Hirst is medical director of the fifty-bed maternity hospital.——The first annual banquet of the ex-resident physicians of St. Joseph's Hospital was held at the Bellevue-Stratford recently with Dr. James A. Kelly as toastmaster.

Faculty Changes at Temple.—New appointments to the faculty of Temple University School of Medicine include the following:

Dr. John F. Huber, associate professor of anatomy.
Dr. Thomas M. Durant, associate professor of medicine.
Dr. George Elbert Farrar Jr., assistant professor of medicine.
Dr. David Soloway, assistant professor of histology and embryology.
Dr. Walter S. Cornell, and T. Ruth Weaver and Lyle Jenne, Ch.E., assistant professors of hygiene, sanitation and public health.

The promotion of Dr. Harriet L. Hartley to be professor of hygiene, sanitation and public health was also announced.

Pittsburgh

The New Allegheny General Hospital.—The Allegheny General Hospital, first opened fifty years ago with fifty beds, dedicated a new building with a capacity of 600 beds June 22-26. Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, and Mr. E. H. Foley Jr., director of the legal division of the Public Works Administration, were the speakers at the formal dedication June 24. Work on the new building was begun in 1929 after a fund of $5,000,000 had been raised by popular subscription. In 1931 construction was halted because of the depression and was resumed in 1935 with a loan of $2,000,000 by the Public Works Administration. The hospital is of the skyscraper type with a central stem twenty floors high and wings set back at intervals. It has nine floors for private patients, one for semiprivate patients and two for ward patients. One is devoted to care of children. The obstetric department

The New Allegheny General Hospital

occupies the fifteenth, sixteenth and seventeenth floors. One wing houses the Singer Memorial Laboratory, running from the basement and including the third floor. The outpatient department and various special departments are on the second floor. Dr. Gustav Walter Zulauf is superintendent of the hospital.

TEXAS

Health at San Antonio.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended June 27, indicate that the highest mortality rate (21.6) appears for San Antonio and for the group of cities as a whole, 10.9. The mortality rate for San Antonio for the corresponding period last year was 15.6 and for the group of cities, 10.5. The annual rate for eighty-six cities for the twenty-six weeks of 1936 was 12.9 as against a rate of 12.2 for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

Special Society Elections.—Dr. Edward H. Schwab, Galveston, was elected president of the Texas State Heart Association at the recent annual meeting and Dr. Robert M. Barton, Dallas, secretary. Drs. Arthur J. Schwenkenberg, Dallas, was made president of the Texas Neurological Society and Dr. Wilmer L. Allison, Fort Worth, reelected secretary. The Texas Railway Surgeons Association elected Dr. Charles E. Scull, San Antonio, president, and Dr. Ross B. Trigg, Fort Worth, secretary. Dr. George B. Cornick, San Antonio, was made president of the Texas Pediatric Society and Dr. Frank H. Lancaster, Houston, was reelected secretary. At the meeting of the Texas Dermatological Society, Dr. Culver M. Griswold, Houston, was elected president, and Dr. Everett R. Seale, Houston, reelected secretary. All these societies met in Houston during the annual session of the State Medical Association of Texas.

WASHINGTON

Society News.—Dr. Morris Fishbein, editor of THE JOURNAL, addressed the King County Medical Society, Seattle, July 2, on "New Forms of Medical Practice."——Dr. Howard B. Kellogg, Seattle, addressed the Cowlitz County Medical Society, Yakima, in May on "Diagnosis and Treatment of Thrombo-Angiitis Obliterans" and Mr. Harry Mackler, chemist, on "Irritating Properties of Smoking Tobaccos."——Drs. Walter

Kelton, Seattle, and Herbert W. E. Johnson, Everett, addressed the Snohomish County Medical Society, Everett, May 7, on "Clavicle Crutch Splint" and "Injection Treatment of Hernia" respectively.

WEST VIRGINIA

State Medical Meeting and Election. — Dr. William S. Fulton, Wheeling, was chosen president of the West Virginia Medical Association at the annual session in Fairmont, June 8-10, to take office January 1, succeeding Dr. Charles G. Morgan, Moundsville. Drs. George R. Miller, Fairview, and Frank C. Hodges, Huntington, were elected vice presidents. Guests of honor at the meeting were:

Dr. Lawrence T. Royster, Charlottesville, Va., Rheumatic Heart Disease in Children.
Dr. Frank H. Lahey, Boston, Gallstones and Ulcers.
Dr. Arthur M. Fishberg, New York, Coronary Thrombosis.
Dr. James Homer McCready, Pittsburgh, Status of the Allergic Nose in Sinusitis, Hay Fever and Asthma.
Dr. George R. Livermore, Memphis, Tenn., Diseases of the Prostate.
Dr. Warren T. Vaughan, Richmond, Va., Newer Methods in the Diagnosis and Treatment of Food Allergy.
Dr. George Alvin Ulrich, Philadelphia, Breech Presentations.

Dr. Frank C. Hodges, Huntington, delivered the annual oration on medicine, on "The Diagnostic Value of Intradermal Injections," and Dr. Russell B. Bailey, Wheeling, the oration on surgery, on "Thoracic Surgery." Dr. Thurman B. Rice, Indianapolis, was the speaker at the annual banquet, Wednesday evening, June 10, at the Fairmont Hotel, on health fads. The West Virginia Heart Association, the West Virginia Society of Industrial Physicians and Surgeons and the West Virginia Society of Obstetricians and Gynecologists held their annual sessions during the week. Tuesday afternoon, June 9, a monument to the founders of the association was dedicated at Rivesville.

GENERAL

Fever Therapy Conference Postponed.—The First International Conference on Fever Therapy, which was to have been held in September, has been postponed to March 30-April 2, 1937. Sessions will be held at the College of Physicians and Surgeons of Columbia University, New York. A tour has been arranged to follow the conference to enable physicians to observe methods of fever therapy used in various hospitals. The American committee consists of Dr. Walter M. Simpson, Dayton, Ohio, chairman; William Bierman, New York; Frank W. Hartman, Detroit; Leland E. Hinsie, New York; Clarence A. Neymann, Chicago, and Stafford L. Warren, Rochester, N. Y. Further information may be obtained from Dr. Bierman, 471 Park Avenue, New York.

Child Neurology Research.—With a grant from the Friedsam Foundation, a special committee is to be formed under the direction of Dr. Bernard Sachs, New York, to stimulate research in child neurology and allied fields, so that physicians and other scientists may contribute to the thorough investigation of problems bearing on the care and cure of those afflicted with any of the nervous and mental disorders from birth through adolescence. This work is to be nationwide in scope and is to be encouraged by stipends, scholarships or otherwise and is not to be limited to special groups or institutions. The committee is to be made up of two neurologists in addition to Dr. Sachs, the director, two pediatricians, one orthopedic surgeon and two laymen. The foundation has been established to carry out the bequests and intentions of the late Colonel Michael Friedsam, who was greatly interested in child health and welfare. The trustees have agreed that neurology and psychiatry have important relations to the early training of children, to development of character and to general medical and home conditions, and that the problems of child health and welfare may be properly considered to be closely allied fields for investigation. Details of the program already under consideration will be announced early in the autumn. After September 10, communications may be addressed to: Child Neurology Research, Bernard Sachs, M.D., Director, 116 West Fifty-Ninth Street, New York.

Provisional Figures for Fourth of July Accidents.—Traffic accidents led the list of causes of death in Fourth of July accidents, accounting for 254 lives throughout the nation, the Chicago *Tribune* reported. Seven fatalities from firecrackers were reported, according to a compilation of the Associated Press. The American Museum of Safety reported the injury of at least 7,738 persons and thirty deaths in a compilation of Fourth of July accidents in 1935. More deaths were recorded for the holiday this year than for the previous five years, with a provisional total of 444 deaths. One hundred and four persons were drowned, while miscellaneous fragedies accounted for thirty-seven more in fifteen states. In New York City 591 persons were treated at hospitals for fireworks burns. Two men were killed at Lexington, Mich., when fireworks blew up on a scow during the celebration there, and sixteen spectators at a community fireworks display at Findlay, Ohio, were hurt by a noise bomb that shot across the river into the crowd instead of rising in the air as expected; 343 injuries were attributed to fireworks in St. Louis. Kansas City, which has an anti-firecracker ordinance, reported 100 injuries with no deaths; 300 minor fireworks injuries were reported in northern California. In Remsen, Iowa, fifteen families were homeless on account of a fire started when a little girl's firecracker was lighted in a tent near a café. Business establishments covering four blocks were in ruins, with the estimated damage reported at $1,000,000.

Society News.—The Eastern section of the American Congress of Physical Therapy held a meeting in Philadelphia, May 27-28. Speakers the first day included Drs. Norman E. Titus, New York, on "Treatment of Erysipelas with Ultraviolet Energy"; Gervase J. P. Barger, Washington, D. C., "Fever Therapy in Office Practice" and John de P. Currence, New York, "Physical Therapy in Treatment of Arthritis." The second day was devoted to clinics at Jefferson Hospital and a joint meeting was held with the Philadelphia County Medical Society the evening of May 27.——Dr. John H. Stokes, Philadelphia, was elected president of the American Dermatological Association at its annual meeting, June 5; Dr. Frederick D. Weidman, Philadelphia, is secretary.——The American Otological Society elected Dr. Edmund P. Fowler, New York, president for the coming year; Dr. Thomas J. Harris, New York, is secretary.——At a meeting of the Association for the Study of Internal Secretions, May 12, Dr. Francis M. Pottenger, Monrovia, was chosen president, and Dr. Eberle Kost Shelton, Santa Barbara, secretary. The next annual session will be held at Atlantic City.——A. W. Jones, St. Louis, executive secretary of the St. Louis Tuberculosis and Health Association, was elected president of the National Conference of Tuberculosis Secretaries at its annual meeting in New Orleans in April.——Dr. Munford Smith, Los Angeles, was chosen president of the American Sanatorium Association at the annual session in New Orleans in April.

Pan American Conference of Health Directors.—The third Pan American Conference of National Directors of Health was held in Washington in April with representatives from South and Central American countries, Mexico and Cuba present. Dr. Hugh S. Cumming, former surgeon general of the U. S. Public Health Service, was elected president of the conference and Dr. João Barros Barreto, Brazil, general secretary. Among the subjects discussed was a report on modern trends in public health. The conference recommended establishment of scientific services especially charged with the study of problems of public health, distinct from those concerned with health administration; it recommended also study in each country of methods of sewage disposal; investigations of industrial diseases and accidents, especially pneumoconiosis; extension of maternity centers and education of women in health matters. A report on health problems in high altitudes, presented by the delegate from Peru, prompted the conference to suggest that countries with inhabited high plateaus organize institutes to study these problems and report to the Tenth Pan American Sanitary Conference in 1938. Consideration was given to the subject of nutrition. The conference urged active campaigns against drug addiction, improvement in control over traffic in narcotics and investigation of results obtained by enforcement of international agreements. Other topics discussed at the conference were amebiasis, leprosy, poliomyelitis, trachoma, venereal disease, malaria, the carrier problem and vaccines.

CORRECTIONS

Dural Sac Instead of the Cord.—In Dr. Walter D. Abbott's paper on "Compression of the Cauda Equina by the Ligamentum Flavum," published in THE JOURNAL June 20, the words "dural sac" should have been used instead of the words "the cord," in lines 5 and 6, page 2130.

Reference to Ergotamine Tartrate.—A reference to Dr. S. S. Lichtman's communication to the editor, entitled "Clinical Use of Ergotamine Tartrate," inadvertently was left in the index in the June 27 issue of THE JOURNAL. This communication was withdrawn from the pages at the last moment to provide space in that issue for the obituary of Dr. Tate Mason, President of the Association, whose death occurred a few hours before THE JOURNAL went to press. Dr. Lichtman's communication appears in the present issue, page 148.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 23, 1936.

Decline in Medicinal Use of Alcohol

At one time alcohol was extensively prescribed in England for the treatment of disease, mainly for its supposed action as a stimulant; but its use has been diminishing, as shown by figures given in a booklet by Dr. C. C. Weeks entitled "Alcohol in Hospital Practice." Combining the figures of every class of hospital, he found that in 1900 with 383,000 patients the average cost of alcohol per patient was 20 cents, which in terms of brandy is equivalent to 6 9/10 ounces. In 1923 with 670,800 patients the average cost was 16 cents per patient, equivalent to 1 3/10 ounces of brandy. The much greater reduction in the brandy than in the cost is due to a great increase in the cost of alcoholic drinks since the war. In 1934, with 1,704,222 patients, the cost was 7.5 cents, equivalent to 69/100 ounce per patient. In the great London hospitals the decrease in thirty-four years has been from 10 ounces per patient to less than 1 ounce, and in the provincial hospitals from nearly 8 ounces to about three-fourths ounce. Since 1889 the spirits used in mental hospitals of the London County Council have been reduced from 20 ounces to less than one-fifth ounce per patient.

Dr. Weeks attributes the reduction to the convergent effect of many lines of evidence regarding the nature and action of alcohol, from physiologic and pharmacologic investigation and a clearer recognition of its pathologic action. Clinically it has been shown that when alcohol is withheld the death rate from pneumonia, for example, is reduced and the period of convalescence from infectious diseases shortened. Prof. John Hay contrasted the cases of pneumonia treated at the Royal Southern Hospital, Liverpool, with and without alcohol. He wrote: "The results were remarkable. They left no doubt in my mind that alcohol given to fortify and strengthen the heart failed in its purpose, and instead of helping the patient to fight the infection materially diminished his chances of recovery." The average age in each group was 35 years. Deleting the cases moribund on admission, the mortality in the cases treated with alcohol was 36.8 per cent; in those treated without alcohol 21.4 per cent. At the Western Fever Hospital, London, Dr. J. D. Rolleston found that in the year before he became superintendent 2,589 ounces of brandy had been used, while in the early months of 1926 914 ounces had been used. As a result of his advice and example only 77 ounces was used in the rest of the year. In 1927 25 ounces was used; in 1928, 1 ounce. Since then neither in the hospital nor in the extensive ambulance service has any wine or spirit been used in the treatment of many thousands of patients. In the army the strong tradition in favor of the issue of a rum ration after exposure to cold and wet is dying out. A new regulation, issued in 1926, provides for the issue of a ration of rum or a pint of cocoa.

Broadcasting an appeal on behalf of the National Temperance Hospital, Lord Moynihan said: "It has done national work in demonstrating that the routine use of alcohol in the treatment of disease is unnecessary. It is difficult to realize that fifty years ago the use of alcohol was considered necessary in the treatment of disease and for the maintenance of good health. In 1873 the hospital began its work. The general attitude of the medical profession was antagonistic. In one of the leading medical journals of that time the doctors of the hospital were solemnly warned that there was such a place as Newgate (the well known gaol) and that their rash attempt to treat disease without alcohol might result in conviction for manslaughter. Today medical science is of one mind that alcohol, while it has its uses, is unnecessary and often harmful in the routine treatment of disease."

The Medical Research Council's Alcohol Investigation Committee reported: "The popular belief in alcohol as a remedy is largely based on the illusion that it has an important stimulant action on the heart or the respiration and on the vital activities in general. Rational medicine has long abandoned this belief, but it still lingers in popular practice."

Beer Preferred to Milk

The desirability of increased consumption of milk by the nation has of late been frequently emphasized in the press. It is among the lower classes especially that the consumption of milk is deficient. But statistics supplied by G. B. Wilson, consulting secretary to the great temperance organization, the United Kingdom Alliance, shows that they prefer to spend the money derived from returning prosperity on alcoholic beverages. The year 1935 has been one of more employment and more spending of money. The nation consumed 22,710,000 bulk barrels of beer, an increase of 4.9 per cent over 1934 and of 17 per cent over 1933. On this beer the nation spent $750,000,000. The estimated consumption of liquid milk was 802,000,000 gallons, as against 817,000,000 gallons of beer. The price paid for the milk was $415,000,000, as against $750,000,000 for the beer. The deficient consumption of milk by the lower classes is shown by the dietitian Sir John Orr in his work entitled "Food, Health and Income." Thirteen and one-half million persons with weekly incomes of $7.50 and over per head drank 400 million gallons of milk a year, while the same number of persons with incomes under $4 drank only 240 million gallons.

Drug Smuggling in Ships

At the meeting of the Advisory Committee of the League of Nations in Geneva the United States delegate, Mr. Stuart Fuller, proposed drastic measures for the prevention of the illicit traffic in opium and other dangerous drugs. He asked that the owners of ships in which contraband drugs were found might be liable to fines and that notices of reward for information which might lead to seizures should be posted prominently in passenger and cargo vessels and in harbors. Penalties for smuggling should be posted in conspicuous places in these ships. He cited as a good example the warning issued by the British government. The custom of permitting visitors on board vessels on sailing day presented a special problem. They should not be allowed to go on board without special permission and should not be allowed to leave the ship without passing through the customs. In a large liner the ship's company should include detectives who could mingle with the passengers. The Canadian delegate, Colonel Sharman, said that in his country it had been necessary to maintain patrol boats at night to prevent contact between the crew and passengers from the shore. On the other hand Mr. G. S. Hardy, delegate for India, said that experience in that country showed that it might not be always wise to hold owners or officers of a ship responsible for contraband found on board. It was suggested that the help of the seamen's unions should be sought in combating drug traffic in ships.

Silicosis in Coal Miners

The results of an investigation into the causes of miners' silicosis, particularly in the South Wales anthracite coal field, were set forth in a paper read to the Institute of South Wales Engineers by Dr. T. D. Jones, professor of mining at the University College of South Wales. He said that research at the Banting Institute, Toronto, showed that inhalation of small quantities of nitrous fumes with silica dust immensely increased the rate of formation of fibrotic nodules in the lungs. This fact caused the matter to be taken up by the explosive experts

and important conclusions had already been reached. The experiments carried out proved that the principal factor affecting the proportion of nitrous fumes was the wetness or dryness of the condition of firing. The connection between nitrous fumes and silicosis raised the whole question of ventilation in relation to shot firing. It was not the amount of firing done but the conditions in which it took place that mattered. From a comprehensive statistical survey his deduction was that the harm attributed solely to dust in anthracite mines was the result of a number of factors, an important one being exposure to cold on the trolley trains taking men in and out of the collieries. Protection of the men on these would go a long way to prevent silicosis. As to the curative treatment, experts on pulmonary disease should take up the matter at once, and the Welsh National Memorial Association should make provision for the treatment of silicotic cases, even though tuberculosis was absent.

Sterilization of the Unfit

By a large majority the National Conference of Labor Women adopted a resolution for legalizing the voluntary sterilization of the unfit. Dr. Caroline Maule recommended this for persons who were mentally defective or suffering from mental disorder or believed to be carriers of grave physical disability which had been shown to be transmissible; also persons believed to be likely to transmit mental disorder or defect. This voluntary sterilization should be subject to safeguards. Referring to the Roman Catholic opposition to voluntary sterilization, she said that no one who felt strongly on the question had a right to impose their views on Protestants or agnostics. As the suggested bill made sterilization voluntary, Roman Catholics would not have to be sterilized if they did not wish to be. Another physician, Dr. Edith Summerskill, said that she supported voluntary sterilization on purely medical grounds, as a form of preventive medicine. The time was coming when they should prevent people from getting sick. The resolution was opposed by Miss Spencer of the University Labor Federation, who suggested that it might be dangerous to put a piece of legislation through which could be used for other ends. The vote, by a show of hands, gave a large majority in favor of the resolution.

Registration of the Mothers' Age at Birth

Though English vital statistics have been carefully compiled and made the subject of scientific investigation for many years, it is curious that while every birth has to be registered the important fact of the mother's age is not included in the particulars required, as it is in most civilized countries. It is an essential datum in investigating the recent decline in fertility. Its absence has compelled statisticians when dealing with this subject to have recourse to the tables of other countries, where the mother's age is registered, and apply them to the English birth rate, so as to draw a conclusion as to the English birth rate at the various ages. This may be a reliable method, but it is obviously not so satisfactory as the actual figures. In reply to a question in parliament the minister of health stated that it had been for some time the intention to make the necessary alteration in birth registration on the first suitable occasion.

Pollenarium for St. Mary's Hospital

The inoculation department of St. Mary's Hospital has extended its laboratories by the construction of a pollenarium (a building for the collection of grass pollen) which is used in the diagnosis and treatment of hay fever. During 1935 Lord Iveagh, chairman of the inoculation department, grew for it six separate crops of grasses and grain for the collection of pollen with which to treat hay fever. The pollenarium has been built alongside the crops, so that the pollen can be collected under the best conditions. Some 28 pounds has been collected, which represents 580,000 million million grains.

PARIS

(From Our Regular Correspondent)

May 22, 1936.

Annual Report of Social Insurance for 1934

The secretary of labor, whose department administers the social insurance law, has published his report of the application of the law for 1934. The total received as premiums during 1934 was a little over 3 billion francs (about 192 million dollars). This was about 130 million francs (about 10 million dollars) less than the average sum received during the period since 1930. Seven million individuals paid premiums during 1934, the average amount paid by each insured person was about 240 francs (14 dollars) as compared to 280 francs in 1930-1931. The total received in francs as premiums was distributed as follows: 1,378 million francs to the "caisses de repartition" which provide for old age and invalidity (permanent) insurance; 1,238 million francs to the "caisses de capitalisation," which act as a sinking fund for the social insurance law; 78 million francs to the "unions de reassurance et caisses de garantie," which serve as a sort of savings bank for the "caisses" or distributing agencies dealing directly with sickness claims.

Expenditures for sickness, invalidity, maternity benefits and old age insurance rose from 1,086 million francs (about 66 million dollars) to 1,215 million francs in 1934. The average premium received in 1934 was 240 francs, 200 francs (on the average) being paid out as benefits. Of the latter sum, about 82 per cent represents sick benefits, 14 per cent maternity insurance, 3 per cent death claims, and miscellaneous disbursements 1 per cent.

Invalidity has functioned only since 1933; hence comparatively little has been disbursed under this heading so far. Seventy per cent of the permanent invalidity claims were made by insured suffering from pulmonary tuberculosis, 8 per cent from tabes or general paralysis of the insane, and 4 per cent from cancer. The total administrative personnel is 7,000, or less than one official for each thousand insured persons.

The social insurance law has been in force since the fall of 1930, yet this report of the minister of labor has been unable to throw any light on (*a*) which diseases give rise to the greatest amount of reimbursement by the caisses, (*b*) the age periods in which morbidity and mortality rates are highest, (*c*) how much is disbursed for tuberculosis, measles, rheumatism and measles, and (*d*) how much is spent on the family of the sick insured individual.

Another criticism raised by the author of an article in the *Siècle médical* of April 15, 1936, is that the agencies (caisses) which act as the primary receiving and disbursing centers have but little information in these annual reports to serve as a guide as to which individuals should be considered as good and which as poor risks.

Atropine in Postencephalitis Complications

Roemer of Wurttemberg, as the result of the research work of Bremer and some personal clinical experience, found that in the majority of cases following encephalitis the complications were favorably influenced by large doses of atropine. If one began with small doses, as much as 20 mg. (one-third grain) could be given three times daily.

At the March 24 meeting of the Académie de médecine of Paris, Marinesco and Facon of Rumania reported their results with this method of treatment in 200 cases. A solution containing 0.5 Gm. (7½ grains) to one hundred cubic centimeters of water was employed. One drop corresponds to 0.25 mg. (1/240 grain) of atropine. The first dose given is one drop three times a day and in most cases this can be increased to three drops three times a day within ten days, then two drops for the following ten days, and one drop during the rest of the

course of treatment. Dryness of the throat is not a contraindication and disappears soon. If other symptoms, such as vertigo, palpitation or gastric distress appear, the dose should not be increased for several days. As a rule, a larger dose is soon tolerated. Roemer has given as high as from 150 to 300 drops a day, but the authors obtained excellent results in giving only 40 to 60 drops a day. In all cases this amount could be reduced in a short time without interfering with the efficacy of the drug. Atropine has a better effect in recent cases, especially in younger individuals, if no previous treatment, e. g., scopolamine, has been employed.

The action of the atropine on the rigidity seems to be more marked than its influence on the tremor. At times the latter seems to increase although the rigidity is disappearing, but, as soon as an adequately high dose is reached, the tremor becomes less marked and often completely disappears. The tremor in paralysis agitans is less influenced than that observed in Parkinson's disease, because of the difference in the pathologic changes in the two diseases. In spite of this, atropine ought to be employed in paralysis agitans because one often observes remarkable improvement. The ocular symptoms are less uniformly influenced by atropine, but nevertheless an improvement is often noted.

Some cases illustrative of efficacy of the use of atropine in the postencephalitic Parkinson syndrome were cited by Marinesco and Facon. The presence of marked cardiovascular disease is a contraindication to the use of atropine. The authors have never observed any cardiovascular disturbance in 200 cases treated with atropine. The anorexia, with resultant emaciation, at times noted can be combated by the use of insulin. At times, a troublesome diarrhea occurs, but it responds to the administration of pepsin and hydrochloric acid. The action of atropine on the vegetative nervous system best explains its efficacy in most cases of postencephalitic Parkinson's disease, which the authors believe is due to vagotony.

New Laboratories of Medical School

The demolition of the buildings of the Charité Hospital has been completed. Many of the most celebrated medical teachers of France glorified these buildings and there has been much criticism that such important landmarks in the development of medicine during the past three centuries should have been given over to the house wreckers, to be replaced by a modern building to be occupied by the laboratories of the Faculté de médecine, the only medical school in Paris. Some years ago the Rockefeller Foundation offered to contribute three million dollars on the condition that the medical school should leave its present buildings in the Latin quarter and move to a district where lecture halls and laboratories could be in close proximity to one another. This offer was refused, much to the regret of many graduates of the school who have criticized placing the laboratories about half a mile from the main lecture halls in which the curriculum of the exclusively clinical years is given.

Among the most interesting portions of the old Charité Hospital was the amphitheater, in which Courvoisier and later Laënnec taught. This has disappeared completely. Another room of historic interest is that which the interns on emergency duty used as a gathering place and dining hall. Many artists who were friends of the interns and who have since become famous decorated the walls of this "salle de garde." Fortunately, the Assistance publique or administrative body responsible for the free hospitals of the department of the Seine, in which Paris is situated, have had this historic room reconstructed and medical visitors to Paris can in the future admire the magnificent interior of the salle de garde with its invaluable historic associations, at the museum of the Assistance publique on the quai de Tournelle. Those interested in medical history will be well repaid in visiting this landmark.

Complications Following Cesarean Section

In a paper published in the March 15 issue of the *Gazette médicale de France,* P. Brault of Rennes reports his observations of forty-nine pregnancies following cesarean section. The low operation was introduced into France by Schikele and later (1923-1924) by Professor Brindeau. Brault considers this as the greatest advance in obstetrics since the discovery of asepsis. The high (corporeal) operation has been practically abandoned in favor of the low one. The wisdom of this change is amply confirmed by the end results of the high versus the low technic, as the following personal observations of Brault show:

UTERINE RUPTURE AFTER HIGH CESAREAN SECTION

Since 1919, Brault has been able to follow seventeen pregnancies (of longer than three months' duration) in patients previously operated by the high cesarean technic. Four uterine ruptures (22 per cent) were observed in the seventeen cases. This percentage would at first seem high, but statistics found in the literature (varying from 2 to 20 per cent) include all types of cesarean operations and not the high alone. In these four rupture cases four different surgeons or obstetricians had operated. One of them was a personal case. In the remaining seventeen pregnancies a low operation was necessary in six and a high in seven. In eleven of the thirteen cases the condition of the uterine scar was noted. In four of the eleven the scar was defective, in two only of thin paper-like consistency. Suture of the uterine incision with catgut is more likely to result in faulty union than when one uses silk, as Professor Couvelaire of Paris has shown.

LOW (SUPRAPUBIC) CESAREAN SECTION

Brault has not observed a uterine rupture in thirty-two pregnancies occurring in twenty-five women, following the low operation. There have been three spontaneous, two forceps and one basiotripsy. In the twenty-two cases in which a second (low) operation was performed, no trace of the former (low) incision could be found. In three additional cases, a high (second) operation was done, in one case because it was impossible to mobilize the pelvic peritoneum, and in two because Brault deemed that sterilization was indicated. Important adhesions were found in only 11 per cent of the twenty-six low as compared to 36 per cent of seventeen high operations. The change, following the low operation, most frequently noted at the second intervention was the elevation of the base of the bladder and obliteration of the vesico-uterine fold. This condition should be borne in mind by the operator if a second low cesarean operation becomes necessary.

Carcinomatosis and Fever of Undetermined Origin

An unusual case was reported by Olmer and his associates of Marseilles at the March 27 meeting of the Société médicale des hôpitaux of Paris. A man, aged 42, entered the hospital March 28, 1935, on account of persistent fever of undetermined origin. A severe chill followed by profuse perspiration marked the onset, about ten weeks before admission. The fever rose to 102 F. and remained so for three weeks. The only accompanying symptom had been a severe hematemesis. About five weeks before admission, a number of small nodules on the trunk and right thigh were noted, which had continued to increase in size, and at the same time cough and marked expectoration appeared. An attack of a renal lithiasis had occurred seven years before, and a brother had died from gastric and a sister from uterine cancer. On examination, enlargement of the spleen and liver and a subicteric tint and leukocytosis were found. Nine days after admission, the blood culture was positive for the streptococcus. A few days later, an ascites and a para-umbilical nodule appeared. Biopsy of a nodule revealed the adrenal as the primary seat of the tumors. Death occurred

about eighteen days after admission. At the necropsy a large number of enlarged mediastinal lymph nodes compressing the trachea and esophagus were found, and innumerable small nodules of carcinomatous aspect on the peritoneum and in the parenchyma of the liver, kidneys, pancreas and left lung. The primary tumor was a malignant adenoma of the right adrenal. In Olmer's case the clinical picture was that of a septicemia (fever, large liver and spleen, subicteric tint, positive blood culture and subicteric tint). Similar reported cases of malignant adrenal neoplasm with generalized metastasis and accompanied by fever were cited by the authors. Some authors are of the opinion that the widespread metastasis is the cause of the fever but in Olmer's case, at least, there was a concomitant septicemia to explain the fever.

BERLIN

(From Our Regular Correspondent)

May 13, 1936.

New Regulation of the Supervisory Medical Consultant Service

The supervisory medical consultant service (vertrauensärztliche dienst) was until recently regulated by certain provisions of the national insurance law according to which the insurance societies might permit an investigation by a supervisory medical consultant (vertrauensarzt) of the insured's disabilities and the amount of the benefits to be allowed.

The supervisory consultant was, however, prohibited from infringing on the professional prerogatives of the insurance physician (kassenarzt). The insurance society officials were also empowered to appoint either a supervisory consultant or a committee composed of physicians to function in the same capacity. The national physicians' and insurance societies' committee had already issued "rules to govern the investigation of the certifications and recommendations of insurance physicians." Special instructions for the supervisory medical consultants were likewise issued by individual sick insurance societies.

Now the supervisory medical consultant service has been regulated anew by a decree of the minister of labor which became effective April 1, 1936. The innovations are of far-reaching significance. They are the fruit of past experience with supervisory medical service and are especially designed to keep pace with the reorganization of the social insurance.

The power to regulate the supervisory medical service has been taken from the individual sick insurance societies and vested in the insurance authorities of the respective states (landesversicherungsanstalten). Each insurance authority shall hereafter be composed of three sections: an invalid insurance section, a sick insurance section and a supervisory medical service section.

The director of the last named section must be a physician experienced in supervisory medical service. Among his responsibilities are numbered all questions involving the service together with all pertinent sociomedical problems. This means that he is expected to select the personnel for the supervisory service, keep himself informed as to the condition of the insured, and pass on the necessity for therapeutic substances and apparatus, the advisability of hospitalization and so on. Among the sociomedical functions of the director may be mentioned the inspection of health institutions (hospitals, sanatoriums and the like) and the promotion of prophylactic health services as well as participation in those political activities which involve questions of public health: campaigns against common diseases, investigation of facts of genetic import, and similar activities.

A director of supervisory medical service of the state insurance authority does not, as a rule, himself engage in the actual routine duties of service, such as investigation of the patients. For the actual performance of the service each state or province is divided into small districts (unterbezirken), within each of which a supervisory service bureau is established. Individual supervisory physicians may be active for a number of sick insurance societies; namely, for all the societies represented within a given subdistrict. There is accordingly an average of one official supervisory consultant for each 25,000 insured persons. In addition, any active physician not connected with the insurance societies who possesses the necessary qualifications may be enrolled by the subdistrict for this service. Specialists too, when it is deemed expedient, may be called in to supplement and assist the supervisory service.

The supervisory medical service stations are to have charge of the necessary diagnostic routines, above all the highly important roentgen procedures. Each station is to possess adequate laboratory facilities. In addition, each station is to have charge of its own assisting personnel. A card is made out for each insured person examined by the supervisory service, and it is especially to be noted whether or not a roentgenogram of the insured has been made and where it is to be found. This is designed to obviate a needless duplication of pictures. If the insured moves his residence from the jurisdiction of a station, the case history and other papers are transferred to the station of proper jurisdiction. In this way an individual record is preserved which contains all pertinent information and which constantly accompanies the insured so long as his dealings with the insurance society continue.

The supervisory medical consultant service now advises and assists the insurance societies by investigating the disabilities of insured persons and recommending the amount of the benefit to which the claimants are entitled. The supervisory physician also may express himself on the necessity of hospitalization or the admittance into a sanatorium or convalescent home of a sick benefit claimant, and in addition he may certify as to the necessity for and value of the therapeutic substances and appliances. The decision will then rest with the insurance holder himself, whose opinion, however, should not run counter to that of the supervisory doctor excepting for reasons of weight. All these activities are carried out not at the instance of the various sick insurance societies but by order of the insurance authorities in the several states. The supervising physician accordingly is under no obligation to the insurance society but is considered an official and employee of the insurance authority.

The new statute expressly states that the supervising physician must not encroach on the professional activities of the insurance physicians. An insurance doctor on the other hand may propose a second examination of the insured by a supervisory physician in order to verify his own diagnosis.

Specific provisions govern the cooperation between supervisory consultants and the attending physicians of hospitals, sanatoriums and convalescent homes. The supervising physician is, first, to obtain the history from the attending physicians, and he should not resort to an examination of the patient unless such a procedure seems absolutely necessary. Such an examination must be undertaken in the presence of the attending physician. The authority of the attending physician must in no way be encroached on nor shall the routine of the institution be unnecessarily disrupted. It is further expressly stipulated that the results of such an examination shall not be discussed with the attending physician in the presence of the patient. The present expansion of the supervisory medical consultant service within institutions for the care of the sick is in accordance with the expressed wish of the national führer of medicine.

This reorganization of the supervisory service is regarded as a most important step forward. The supervising physician, since he now receives his commission from the insurance authority, exerts a sort of indirect influence on the individual

insurance societies. Among those who participated in the drafting of the new regulations were the supervising physicians themselves together with the national führer of medicine and the League of Insurance Physicians of Germany.

BUCHAREST

(From Our Regular Correspondent)

May 28, 1936.

Infant Mortality in Rumania on the Increase

According to Professor Mezinescu of the Bucharest university, infant and child mortality has increased in recent years. Investigations made by Mezinescu revealed that 50 per cent of the infants died before reaching the first year of life, and of those remaining alive only 50 per cent reached the fifth year. In other words, 12,000 infants die in Rumania before reaching 1 year of age. Not only do we lead in this field in the whole of Europe, says Professor Mezinescu, but what is more regrettable, the rate of infant mortality is not as low now as it was fifty years ago. The situation is not much better in towns than in villages. The mortality rate is highest in Bessarabia and the lowest in the county of Ilfov, which comprises the capital city, Bucharest. Mezinescu calls the attention of the government to the fact that large districts comprising from twenty to twenty-five villages have only one doctor.

Sympathetic Ophthalmia, a Seasonal Disease

At a recent meeting of the Oradea Medical Society, Dr. Béla Waldmann, senior ophthalmologist to the Oradea County Hospital, read a paper which was awarded the prize of the society. The subject was the connection between the occurrence of sympathetic ophthalmia and catarrhal disorders of the nose and upper air passages. In his study of the pathogenesis of sympathetic ophthalmia, which appeared in 1933 in the *Wiener medizinische Wochenschrift,* Waldmann expressed the opinion that the etiologic agent of sympathetic ophthalmia migrates into the eye from the accessory nasal sinuses and thence reaches the other eye by way of the optic nerve or through the ciliary nerves. In a study of sixty-nine cases, fifty-three occurred during the influenza period from October to April, while sixteen cases occurred in the warm months from May to September. Waldmann submitted a questionnaire to sixty-eight eye clinics in all parts of the globe, requesting details of all sympathetic ophthalmia cases that were treated during the latter ten years. Ten questionnaires were returned, filled out with scrupulous care, from Baltimore, Berlin, Budapest, Ghiza (Egypt), London, Madras, Manchester, Munich, Stockholm and Vienna. These blanks embodied 124 cases, which, with the sixty-nine cases mentioned totaled 193 cases. The answers submitted showed that three fourths of the cases occurred between October and April. The proportion at the clinic of Professor Meller at Vienna was 7:1. With these data Waldmann feels justified in asserting that sympathetic ophthalmia is a seasonal disturbance. In India it was the rule 1,000 years ago to perform cataract operations in the springtime and to take care that the patients were free from cold. In the book of Halifa it is stated that the Arabians had two special instruments besides those regularly used at cataract operations for the purpose of blowing into the nose various powders for averting catarrhal disorders.

From the statistical reports submitted, Waldmann concluded that sympathetic ophthalmia supervening after cataract operations occur, on an average, in 40 per cent of the cases. Operations with magnets were followed by sympathetic ophthalmia in eight cases; this fact induced Waldmann to propose that in all cases in which one can expect after recovery only a scanty vision of the injured eye or a prospect that the sight will be lost entirely, to remove the eye and in case of the reluctance of the patient rather to leave the metal piece in the eye. The advantage of preventive enucleation is attested by the Berlin statistics, which, out of twelve cases, embodies only those in which the other eye was unimpaired when the microscopic examination already established the presence of sympathetic ophthalmia. In contrast with these facts, evisceration caused sympathetic inflammation in three instances according to the report of another clinic.

Treatment of Sciatica with Local Anesthesia

Dr. Corneliu Sarbatorescu of Jassy has treated during the last ten years, by means of local anesthesia, thirty-four patients suffering from sciatica. Twenty-three were cured and remained free from recurrences. He makes an alkaline 2 per cent solution of procaine hydrochloride by boiling down to half of its volume a solution consisting of sodium bicarbonate 0.25 Gm., sodium chloride 0.5 Gm., procaine hydrochloride 1 Gm., in 100 cc. of sterilized distilled water. The technic of injection is as follows: A lumbar puncture needle is used, with a glass syringe containing 20 cc. of the solution. The patient sits with the trunk strongly bent forward and with the buttocks projecting backward slightly over the edge of the operating table. The position of the sacrococcygeal membrane, which closes the lower end of the sacral canal, is then identified. Its shape is that of an inverted U or V. The projection formed by the elementary laminae or cornua of the fifth sacral vertebra is first felt for. Between these two cornua is the membrane, which feels elastic and yields slightly to firm pressure. In very fat subjects it may be impossible to find the fontanel. Such cases ought to be excluded at the outset. The needle is pushed perpendicularly through the membrane until it impinges on the anterior bony wall of the sacral canal. The point of the needle is then slightly withdrawn and its direction changes till it runs upward along the canal, pushing up for a distance of 4 to 5 cm. The fluid is then injected slowly, about five minutes being taken to empty the syringe. In a successful case, the injection goes easily and without resistance, no subcutaneous edema is produced, and the patient usually has a feeling of tingling or pressure in both legs. After the injection the patient remains with the trunk propped up and the legs dependent. Any slight feeling of faintness can be checked by a temporary horizontal posture. In from fifteen to twenty minutes all symptoms of sciatica disappear. It is advisable to keep the patient in bed for three or four days afterward.

Dr. Sarbatroescu does not claim that this treatment should be adopted as a routine method in all cases of sciatica. It should be applied when all usual methods fail. A careful diagnosis must first be made; arthritis and intrapelvic and other local causes must be carefully excluded, and even then, before epidural injections are resorted to, the patient should have a fortnight's energetic treatment with hot applications, diathermy and antineuralgic drugs. The method is specially suitable to cases of root pains in which the distribution extends higher up the buttock than in ordinary sciatica. The technic is admittedly somewhat more difficult than that of injection into the sciatic nerve trunk.

Some Factors in the Spread of Typhoid

At the Oradea Medical Society, Dr. Joan Sandor showed by large charts that the great decrease in the incidence of typhoid in the period from 1925 to 1935 was coincident with the increase in the number of parks and alleys in the city. Greater facilities for the isolation of the sick, the supervision of the milk supply and of other foodstuffs, and the removal of flies and refuse had also contributed. Many cases were imported from the adjacent villages, where public hygiene is much to be desired. Sandor had found lake fish to be responsible for many cases of typhoid. The disease may be acquired also by direct contact, the fingers of the patients' attendants being soiled by excreta, and thus food prepared by them becomes infected.

Marriages

PETER ZEMO, Harrisburg, Pa., to DR. RUBY CLAIRE VIRGINIA LEHMAN of Middletown in Bethlehem recently.

DELMAR F. WEAVER JR., Stanardsville, Va., to Miss Beulah Borah Thrift of Washington, D. C., April 2.

ROBERT WATKINSON HUNTINGTON JR., Memphis, Tenn, to Miss Katherine Upchurch of Paris, recently.

SAMUEL SHWARTZ, Boston, to Miss Lillian Rella Resnick of Washington, D. C., at New York, recently.

WILLIAM EDWIN BARNETT, Logansport, Ind., to Miss Mary John Embree of New Harmony, June 18.

PAUL T. LAMEY, Anderson, Ind., to Miss Marion Whetsell of Bedford in Indianapolis, recently.

ROBERT LOUIS MCGEE to Miss William Elizabeth Harrelson, both of Raleigh, N. C., in April.

OSMAH E. HARRELL to Miss Margaret Jane Hughes, both of Jacksonville, Fla., April 6.

VAN A. ODLE to Miss Opal B. Martin, both of Spokane, Wash., March 30.

FRANK VARMUS to Miss Beatrice Barasch, both of Freeport, N. Y., June 24.

Deaths

Francis **Henry Williams** ⊕ Boston; Harvard University Medical School, Boston, 1877; Massachusetts Institute of Technology, Boston, 1873; since 1879 a practitioner of medicine in Boston, and a pioneer in the development of roentgen-ray and radium therapy; instructor in materia medica from 1884 to 1885 and materia medica and therapeutics from 1885 to 1886, assistant professor of materia medica and therapeutics from 1886 to 1888 and assistant professor of therapeutics from 1888 to 1891 at his alma mater; member, and from 1917 to 1918 president, of the Association of American Physicians; member of the New England Roentgen Ray Society and the Société de Radiologie Médicale de France; honorary member of the American Radium Society, American Roentgen Society and the Radiological Society of North America; life member since 1882 of the corporation of the Massachusetts Institute of Technology, and member of the executive committee for twenty-five years; visiting physician from 1896 to 1913 and later senior physician to the Boston City Hospital; author of "The Roentgen Rays in Medicine and Surgery" and "Radium Treatment of Skin Diseases, New Growths, Diseases of the Eye and Tonsils," and frequent contributor of clinical and research work to the periodical literature; aged 84; died, June 22.

Imas **Pryor Rice** ⊕ Aurora, Ill.; University of Illinois College of Medicine, Chicago, 1913; served during the World War; medical director of the Kane County Spring Brook Sanitarium; aged 47; on the staffs of the Sherman Hospital, Elgin and St. Joseph Mercy Hospital, where he died, April 23, of a staphylococcic infection, complicated by pneumonia.

James Whitney Hall, Chicago; Kentucky School of Medicine, Louisville, 1890; member of the Illinois State Medical Society; served during the World War; for many years a member of the lunacy commission of the Cook County Court; aged 66; died, April 29, in the Illinois Central Hospital, of coronary sclerosis and hypertension.

Max Rosenthal, New York; Medizinische Fakultät der Universität Leipzig, Saxony, Germany, 1887; member of the Medical Society of the State of New York; president of the medical board and on the staff of the Sydenham Hospital; on the staffs of the Bronx Hospital and the Beth David Hospital; aged 70; died, April 3.

Bernard Lauriston Hardin ⊕ Washington, D. C.; Columbian University Medical Department, Washington, 1895; on the consulting staffs of the Garfield Memorial Hospital and the Central Dispensary and Emergency Hospital; aged 65; died, April 29, of intestinal hemorrhage due to jejunal ulcer, and chronic nephritis.

Marshall Julius Pierson ⊕ Akron, Ohio; Hahnemann Medical College and Hospital of Philadelphia, 1917; served during the World War; on the staffs of the City Hospital and St. Thomas Hospital; aged 43; died, April 29, in the Cleveland Clinic, of carcinoma of the stomach and rheumatic heart disease.

William Henry Hutchinson, Childersburg, Ala.; Chattanooga (Tenn.) Medical College, 1893; member of the Medical Association of the State of Alabama; past president of the Talladega County Medical Society; aged 69; died, April 17, in a hospital at Sylacauga, of influenza and strangulated hernia.

Jessie Elizabeth Bedford Stubbs, Hot Springs, S. D.; College of Physicians and Surgeons, Keokuk, Iowa, 1897; assistant child welfare chairman for the American Legion Auxiliary Department of South Dakota; aged 70; died, April 13, in St. Mary's Hospital, Rochester, Minn., of carcinoma.

Frederick Herbert Nichols, Jamestown, N. Y.; Syracuse University College of Medicine, 1903; member of the Medical Society of the State of New York; aged 60; died, April 15, in St. Joseph's Hospital, Syracuse, of hemolytic streptococcus septicemia, due to an infection sustained while operating.

Charles Burr Graves ⊕ Gales Ferry, Conn.; Harvard University Medical School, Boston, 1886; past president of the Connecticut State Medical Society; on the staffs of the Lawrence and Memorial Associated Hospitals, New London; aged 75; died, April 24, in a sanatorium at Enfield.

Joseph I. Knoblauch ⊕ Metamora, Ill.; Northwestern University Medical School, Chicago, 1893; past president of the Woodford County Medical Society; formerly mayor and for many years president of the high school board of education; aged 68; died, April 29, of carcinoma.

John Timothy Reynolds, Quincy, Mass.; Baltimore Medical College, 1905; member of the Massachusetts Medical Society; on the staff of the Quincy City Hospital; aged 54; died, April 28, in the New England Baptist Hospital, Boston, of carcinoma of the sigmoid.

Amy Rilus Robinson Chapman, Franklin, Neb.; Grand Rapids (Mich.) Medical College, 1900; Lincoln Medical College of Cotner University, 1902; member of the Nebraska State Medical Association; aged 65; died, April 8, of diabetes mellitus and nephritis.

Thomas Joseph Ragsdale, Lees Summit, Mo.; Marion-Sims College of Medicine, St. Louis, 1895; member of the Missouri State Medical Association; aged 62; died, April 13, of pulmonary embolism, influenza, chronic myocarditis and cholecystitis.

Thomas Crouse Quickel, Gastonia, N. C.; Tulane University of Louisiana Medical Department, New Orleans, 1900; member of the Medical Society of the State of North Carolina; aged 60; died, April 28, of chronic myocarditis and hypertension.

Harrison Talmage Smith, Independence, Va.; Medical College of Virginia, Richmond, 1908; member of the Medical Society of Virginia; for many years a member of the state legislature; aged 52; died suddenly, April 18, of heart disease.

Eben Carver Norton, North Chatham, Mass.; University of Vermont College of Medicine, Burlington, 1885; member of the Massachusetts Medical Society; aged 79; died, April 11, of cerebral hemorrhage, arteriosclerosis and cholelithiasis.

Howard Alonzo Wagner ⊕ Shawnee, Okla.; University of the South Medical Department, Sewanee, 1901; served during the World War; on the staff of the Shawnee Municipal Hospital; aged 60; died, April 26, of coronary thrombosis.

Sewell Norris Pilchard ⊕ Easton, Md.; Jefferson Medical College of Philadelphia, 1910; past president of the Talbot County Medical Society; on the staff of the Emergency Hospital; aged 49; died, April 12, of cerebral hemorrhage.

Walter Scott Sowell, Birmingham, Ala.; University of Alabama Medical Department, Mobile, 1899; served during the World War; aged 61; died, April 27, in the Veterans Administration Facility, Tuscaloosa, of pulmonary tuberculosis.

Robert Lee Greer ⊕ Oakfield, Tenn.; University of Nashville Medical Department, 1890; past president of the Madison County Medical Society; veteran of the Spanish-American War; aged 70; died, April 21, of miliary tuberculosis.

Milton Jacobson ⊕ Amsterdam, N. Y.; Medical College of the State of South Carolina, Charleston, 1919; aged 47; on the staffs of the Montgomery Sanatorium and the Amsterdam City Hospital, where he died, April 29, of cerebellar tumor.

Vincent Aloysius Peters ⊕ Lees Summit, Mo.; State University of Iowa College of Medicine, Iowa City, 1926; deputy coroner of Jackson County; aged 33; died, April 15, in St. Luke's Hospital, Kansas City, of septicemia.

J. P. Prescott, Lake Park, Ga.; Atlanta Medical College, 1890; member of the Medical Association of Georgia; formerly member of the county school board, member of the council of Lake Park and mayor; aged 70; died, April 4.

Cecil Durham Stech, Council Bluffs, Iowa; John A. Creighton Medical College, Omaha, 1913; aged 46; on the staff of the Mercy Hospital, where she died, April 12, of streptococcic infection, pneumonia and meningitis.

Lawrence Arthur Renehan, Darien, Conn.; University of Vermont College of Medicine, Burlington, 1922; served during the World War; aged 41; died, April 29, of chronic nephritis, myocarditis and arteriosclerosis.

Charles Rainey Thomas, Roodhouse, Ill.; St. Louis Medical College, 1887; member of the Illinois State Medical Society; past president of the Greene County Medical Society; aged 72; died suddenly, April 3.

Charles W. Fleenor, Bristol, Va.; Kentucky School of Medicine, Louisville, 1893; member of the Tennessee State Medical Association; aged 65; died, April 5, in Holston Valley, of coronary thrombosis.

Ralph Jackson Raybeck ⊕ Pittsburgh; University of Cincinnati College of Medicine, 1919; aged 41; on the staff of the Allegheny General Hospital, where he died, April 27, of coronary thrombosis.

Harry Edward Anderson ⊕ Somersworth, N. H.; Medical School of Maine, Portland, 1910; past president of the Strafford County Medical Society; served during the World War; aged 49; died, April 22.

William Domenico Vento, New York; University and Bellevue Hospital Medical College, New York, 1903; aged 57; died, April 15, in the Flower Hospital, of arteriosclerosis and hypertension.

Alfred J. Pickering, Huntington, W. Va.; Maryland Medical College, Baltimore, 1910; formerly city health officer; aged 61; died, April 17, of cardiorenal disease and cerebral hemorrhage.

James Madison Horton, New York; College of Physicians and Surgeons, Baltimore, 1890; member of the Medical Society of the State of New York; aged 71; died, April 21, of lobar pneumonia.

Elam Turner Murphy, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; aged 60; died, April 27, of carcinoma of the prostate.

Arthur Edgar Graves, New Waverly, Ind.; Rush Medical College, Chicago, 1884; member of the Indiana State Medical Association; aged 79; died, April 27, in the Harper Hospital, Detroit.

Silas Franklin Johnson, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1894; for many years a medical missionary; aged 70; died, April 19.

Joseph Anthony Tempesto, Trenton, N. J.; Jefferson Medical College of Philadelphia, 1913; member of the Medical Society of New Jersey; aged 45; died, April 17, of nephritis.

Roy William Allen, Rochester, Minn.; State University of Iowa College of Medicine, Iowa City, 1904; aged 55; died, April 27, in St. Mary's Hospital, of fracture of the femur.

Edward Payson Morrow ⊕ Canton, Ohio; Miami Medical College, Cincinnati, 1883; on the staff of the Aultman Hospital; aged 77; died, April 14, of coronary arteriosclerosis.

William Henry Estes, Lincolnton, Ga.; University of Georgia Medical Department, Augusta, 1900; formerly member of the state legislature; aged 59; died, April 21.

Leonard McClintock ⊕ Beacon, N. Y.; Albany (N. Y.) Medical College, 1897; on the staff of the Highland Hospital; aged 65; died, April 21, of coronary thrombosis.

Joseph Camile Eugene Arseneau, Fort William, Ont., Canada; Trinity Medical College, Toronto, 1906; aged 58; died, April 6, in Rochester, Minn., of arteriosclerosis.

Samuel Fearn Perkins, Los Angeles; Vanderbilt University School of Medicine, Nashville, Tenn., 1921; served during the World War; aged 37; died, April 20.

Roswell W. Comstock, Maumee, Ohio; Detroit College of Medicine, 1901; served during the World War; member of the board of education; aged 60; died, April 27.

John Ridout, Annapolis, Md.; University of the City of New York Medical Department, 1892; aged 68; died, April 28, near Ellicott City, of cerebral hemorrhage.

Charles W. Beitzel, Norton, Kan.; Jefferson Medical College of Philadelphia, 1890; aged 67; died, April 30, in a local sanatorium, of pulmonary tuberculosis.

Frank Stedman Bulkeley, Ayer, Mass.; Harvard University Medical School, 1902; aged 57; died, April 19, of hypernephroma with pulmonary metastasis.

Joseph L. Price, Sherman, Ky.; Kentucky School of Medicine, Louisville, 1884; member of the Kentucky State Medical Association; aged 76; died, April 16.

John L. Axtell, Cochranton, Pa.; Western Reserve University Medical Department, Cleveland, 1882; aged 76; died, April 6, of chronic myocarditis.

Loury L. Quick, New Waverly, Ind.; Medical College of Indiana, Indianapolis, 1879; Civil War veteran; aged 89; died, April 25, of bronchopneumonia.

Frederick Raymond Glover, Mahwah, N. J.; University of the City of New York Medical Department, 1885; aged 73; died, April 4, of heart disease.

Peyton Page Nottingham, Ferrum, Va.; University of the South Medical Department, Sewanee, Tenn., 1904; aged 55; died suddenly, March 10.

Lewis Edward Haecker ⊕ Hampton, Iowa; Rush Medical College, Chicago, 1894; on the staff of the Lutheran Hospital; aged 72; died, April 18.

John F. Cromley, Lamar, Mo.; Eclectic College of Physicians and Surgeons, Indianapolis, 1894; aged 79; died, April 30, of diabetes mellitus.

Austin McMichael, Rockport, Mo.; St. Louis Medical College, 1879; member of the Missouri State Medical Association; aged 81; died, April 7.

Ragnvald Leland, Kenyon, Minn.; University of Minnesota Medical School, Minneapolis, 1895; aged 70; died, April 28, of coronary thrombosis.

John Arden Conley, Penn Yan, N. Y.; Eclectic Medical College of the City of New York, 1888; aged 68; died, April 13, of paralysis agitans.

George S. Matlock, Carthage, Ark.; University of Arkansas School of Medicine, Little Rock, 1900; aged 69; died, April 26, of acute nephritis.

Marcell Hartwig, Los Angeles; Medizinische Fakultät der Friedrich-Wilhelms-Universität, Berlin, Prussia, 1873; aged 85; died, April 18.

Will K. Johnson, Garnett, Kan.; Keokuk (Iowa) Medical College, 1891; aged 79; died, April 30, of chronic cystitis and nephritis.

Edward Marcellus Bixby, Oakland, Calif.; College of Physicians and Surgeons of San Francisco, 1899; aged 77; died, April 24.

William F. C. Hormann, Los Angeles; Bennett College of Eclectic Medicine and Surgery, Chicago, 1903; aged 70; died, April 5.

Simeon McCausland Metcalf, Los Angeles; Harvard University Medical School, Boston, 1881; aged 78; died, April 28.

Robert White Naylor, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1915; aged 46; died, April 16.

Florence V. Wall Cheney, Turlock, Calif.; California Medical College, San Francisco, 1891; aged 68; died, April 13.

Elmer Jones Davis, San Diego, Calif.; Rush Medical College, Chicago, 1903; aged 67; died, April 12, of heart disease.

John Robert Blacklidge, Abbeville, Ala.; Medical College of Alabama, Mobile, 1889; aged 80; died, April 28, of senility.

Ira Holden Fiske, Pasadena, Calif. (licensed in California in 1920); aged 85; died, April 12, of chronic myocarditis.

Elwin Witt Ames ⊕ Los Angeles; University Medical College of Kansas City, Mo., 1894; aged 68; died, April 4.

George E. Grover, Traverse City, Mich.; Saginaw (Mich.) Valley Medical College, 1898; aged 69; died in April.

William H. Armstrong, Rogersville, Tenn.; Louisville (Ky.) Medical College, 1889; aged 74; died, April 9.

Joseph Edward Blackshaw, Hemet, Calif.; Pulte Medical College, Cincinnati, 1891; aged 81; died, April 18.

Walter D. Pelle, Louisville, Ky.; Hospital College of Medicine, Louisville, 1889; aged 73; died in April.

John H. Snively, Justus, Ohio; Medical College of Ohio, Cincinnati, 1891; aged 73; died, March 31.

William Stephan, Cincinnati; Medical College of Ohio, Cincinnati, 1896; aged 77; died, April 21.

Robert E. Atkinson, Proctorville, Ohio; Columbus Medical College, 1886; aged 84; died, April 2.

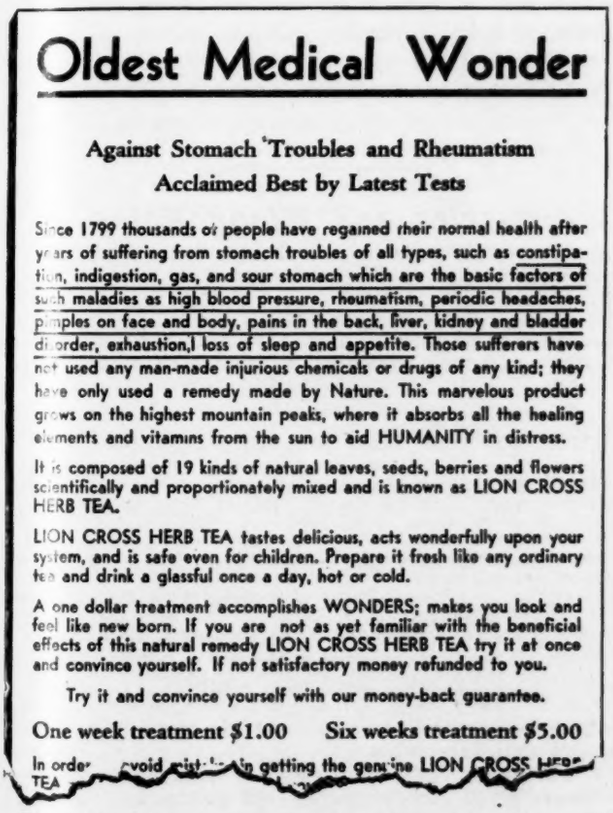
Bureau of Investigation

LION CROSS HERB TEA OR LION CROSS TEA

A "Wonder of Nature" Declared a Fraud

From New York City the "Lion Cross Phar.," "Lion Cross Products Co." and the "Lio Pharmacy" exploited a "cure-all" herb mixture known as "Lion Cross Herb Tea" or "Lion Cross Tea."

According to the memorandum of Mr. Karl A. Crowley, Solicitor for the Post Office Department, the business was carried on by one Benjamin Eidinger, under the above-mentioned names. Lion Cross Herb Tea, or Lion Cross Tea, was offered through the mails as a preparation that would, "when used as directed," heal those suffering from stomach trouble, rheumatism, kidney and liver troubles, hardening of the arteries and various other ailments.



Oldest Medical Wonder

Against Stomach Troubles and Rheumatism

Acclaimed Best by Latest Tests

Since 1799 thousands of people have regained their normal health after years of suffering from stomach troubles of all types, such as constipation, indigestion, gas, and sour stomach which are the basic factors of such maladies as high blood pressure, rheumatism, periodic headaches, pimples on face and body, pains in the back, liver, kidney and bladder disorder, exhaustion, loss of sleep and appetite. Those sufferers have not used any man-made injurious chemicals or drugs of any kind; they have only used a remedy made by Nature. This marvelous product grows on the highest mountain peaks, where it absorbs all the healing elements and vitamins from the sun to aid HUMANITY in distress.

It is composed of 19 kinds of natural leaves, seeds, berries and flowers scientifically and proportionately mixed and is known as LION CROSS HERB TEA.

LION CROSS HERB TEA tastes delicious, acts wonderfully upon your system, and is safe even for children. Prepare it fresh like any ordinary tea and drink a glassful once a day, hot or cold.

A one dollar treatment accomplishes WONDERS; makes you look and feel like new born. If you are not as yet familiar with the beneficial effects of this natural remedy LION CROSS HERB TEA try it at once and convince yourself. If not satisfactory money refunded to you.

Try it and convince yourself with our money-back guarantee.

One week treatment $1.00 Six weeks treatment $5.00

In order to avoid mistakes in getting the genuine LION CROSS HERB TEA

The advertising matter quoted in the Solicitor's report described this nostrum as a natural, wonderful remedy (God's Gift) which had helped hundreds of men, women and children with such unrelated conditions as:

Headache	Loss of appetite	Back pains
Heartburn	Loss of sleep	Kidney disorders
Indigestion	Rheumatism	Arthritis
Gas on stomach	Neuralgia	Bladder trouble
Female irregularities	Loss of pep in men and women	Pimples and skin eruptions

The famous quack of seventeenth century England, Sarah Cornelius de Heusde, proclaiming her knowledge of the mysteries of nature, new inventions, natural remedies to cure many and divers complaints from the sign of the "Red Lyon," could not have matched the healing qualities proclaimed for the twentieth-century Lion Cross Tea of New York City.

Lion Cross Herb Tea was described as being composed of nineteen varieties of natural flowers, berries, seeds, barks and roots. No ordinary herbs were these. An advertisement translated from a foreign-language newspaper introduced during the Post Office Department hearing declared that they grew on the tops of the highest mountain peaks nearest the sun, where they absorbed all the healing vitamins and elements which aid to restore the normal functions, thereby bringing health to every organ of your body.

Admittedly, this was good old Mother Nature at her "patent medicine" best, healing headaches, rheumatism, and throwing in for good measure "the mysterious vitamin 'E' which brings back lost procreative powers to men and women." Of the nineteen assorted flowers and other parts of plants that this "shotgun" herb conglomeration was alleged to contain, the shrinking violet was certainly not one. An advertisement of Lion Cross Herb Tea carried by the *Radiant Health Digest*, a publication which, incidentally, calls itself "A National Journal of Food Science," states: "Oldest Medical Wonder—Against Stomach Troubles and Rheumatism—Acclaimed Best by Latest Tests—Since 1799 thousands of people have regained their normal health after years of suffering from stomach trouble of all types, such as constipation, indigestion, gas, and sour stomach which are the basic factors of such maladies as high blood pressure, rheumatism, periodic headaches, pimples on face and body, pains in the back, liver, kidney and bladder disorders, exhaustion, loss of sleep and appetite. Those sufferers have not used any man-made injurious chemicals or drugs of any kind; they have only used a remedy made by Nature."

Persons who nibbled at such advertising bait received a special typewritten letter. The letterhead on which such letters were written contained what purported to be a coat of arms, with the notation "Est. 1799." A printed circular accompanying the letter proclaimed:

"Dear Friend:

"Do not throw this important message away, but read it to the very end and digest every word of it, because this information will save you many dollars and bring HEALTH, HAPPINESS AND LONG LIFE to you and your dear ones."

A specimen of the "Oldest Medical Wonder," when examined by government chemists, was found to consist of a coarsely ground mixture of herbs, as follows:

Senna leaves, corn flowers (Centaurea), fennel seed, caraway seed, anise seed, chamomile flowers, dried orange peel, saffron flowers, licorice root, basswood (tilea) flowers, triticum, sassafras bark, juniper berries, peppermint leaves, lavender flowers, equisetum, mullein leaves, and marshmallow root.

This, then, was the drugless life-prolonger, strength-giver and nerve-balancer! The "blessing for diabetes and loss of powers" failed utterly to impress the government's medical experts, who declared that practically the only therapeutic effect of the preparation would be laxative and diuretic, with a slight carminative action on the stomach, and that a tea brewed from this mixture and used as directed would not heal persons suffering from all stomach troubles, rheumatism and kidney and liver troubles.

The Solicitor's memorandum to the Postmaster General contained further medical testimony to the effect that no treatment known to the medical profession will cure hardened arteries or restore atrophied elastic fibers, and that it is untrue to represent that the tea brewed from Lion Cross Tea will purify the blood. Except for the resultant effects of habitual laxation through the use of this preparation, it will have no effect upon the blood, either in purifying it or in regulating its pressure.

The chief danger from nostrums of this type is that many persons having a fundamental belief in herb mixtures and suffering from serious or chronic ailments may be lulled into a false sense of security.

Although the evidence showed that his concern had been in business only about a year, Eidinger's brazen use of the phrase "Est. 1799" no doubt bolstered the faith of many of the gullible in his nostrums. Indeed, among the complaints received were some from newspapers which, taken in by the apparent age of the firm, had accepted advertising copy for which they had received no pay.

The Solicitor for the Post Office Department, after hearing the evidence, recommended that a fraud order be issued against the Lion Cross Phar., Lion Cross Products Co., Lio Pharmacy and their officers and agents as such at New York. The Postmaster General under date of April 20, 1936, found the above-mentioned concerns and parties engaged in conducting a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises, and closed the United States mails to them.

Correspondence

CLINICAL EXPERIENCE WITH ERGOTAMINE TARTRATE

To the Editor:—Clinical reports of gangrene from the use of ergotamine tartrate recently published in THE JOURNAL (May 9, pages 1625 and 1631) merit comment. The case reported by Yater and Cahill emphasizes anew the dangers of ergotism when overdoses are given. The case reported by Gould, Price and Ginsberg in the same issue indicates that even therapeutic doses may lead to serious consequences in special instances.

Since I advocated the use of ergotamine tartrate for the relief of distressing pruritus in jaundice and uremia (THE JOURNAL, Nov. 14, 1931, p. 1463) Snell and Keyes have reported its successful use in thirteen cases of jaundice without ill effect (*M. Clin. North America* **16**:1455 [May] 1933). My further experience with the drug for this purpose has been with approximately seventy-five persons. Three instances have occurred in which unfavorable side actions might possibly be connected with its use. A man, aged 65, with advanced generalized atherosclerosis, developed a brief attack of tachycardia with precordial distress following a second oral dose of 1 mg. Three subsequent doses caused no complaints. A second person in the same age decade, with obstructive jaundice due to carcinoma, developed a clinical picture simulating coronary artery thrombosis with feeble pulse, cyanosis and fall in systolic blood pressure after four doses had been taken by mouth. The drug was discontinued. The entire clinical picture changed. The patient made a complete recovery from the circulatory disturbance. A jaundiced physician, aged 45, received three doses of gynergen by mouth for pruritus. The peripheral veins were seen to be collapsed when attempts were made to collect blood samples. Four days later, after 7 mg. of the drug had been taken, the pulse was noted to be very feeble and the extremities cold. The systolic blood pressure was not measurable. Bradycardia was persistent. Aside from weakness, the patient was alert, accepted food, and appeared well. Oscillometric readings and skin temperatures were reduced in all extremities. Three days later all objective disturbances had disappeared. The patient recovered from the severe liver degeneration.

Pruritus was relieved in approximately 50 per cent of cases. Resistant cases usually failed of relief by all other measures. The first dose may indicate the prospect of relief. I have found the best method of administration to be as follows: The first dose is given in the evening. If it is beneficial, the patient sleeps undisturbed by itching. Three doses are then given by mouth the following day. The drug is discontinued if no relief is obtained and if pains and paresthesias appear in the limbs. If partial relief is obtained, the drug is continued for three more doses. I have seen complete relief following a single dose in a patient with itching lasting several months due to obstructive biliary cirrhosis. The itching was so severe that gloves were worn during sleep.

Ergotamine tartrate has been used over longer periods of time in the treatment of hyperthyroidism and more recently in migraine (Lennox, W. G.: *New England M. J.* **210**:1061 [May 17] 1934). The drug was administered to forty-five patients with this condition without harm. Sometime ago, in the course of carefully controlled studies evaluating measures for the treatment of essential hypertension, I had occasion to test the effects of the drug in fifteen patients with arterial hypertension, in doses of 1 mg. three times daily over a period of four weeks. The patients were warned to discontinue the drug promptly if unfavorable reactions appeared, but none occurred. Thus in Lennox's and my experience no mishap occurred in fifty cases with use of the drug over longer periods.

The use of powerful drugs for the relief of distressing clinical symptoms is always fraught with the danger of misuse by the careless and inexperienced despite warning as to their potential toxic effects. This is especially true of medicaments which are effective in milligram doses. Single doses may produce remarkable results. When ineffective, even larger and repeated doses may fail to produce the desired therapeutic response. In the hands of the experienced, the response is gaged from dose to dose and standing orders are not issued.

Dangers from overdosage apply to all drugs. In the case of ergotamine tartrate treatment, therapeutic doses must be given only when strict supervision of the effects of the drug on the patient is possible. Single doses have relieved pruritus in jaundice and attacks of migraine. The use of such a powerful and effective remedy should not be discontinued because reports of gangrene following overdosage appear in the literature or because therapeutic doses prove toxic in a person under special circumstances of advanced atherosclerosis, heart failure, and complicated history of intoxications with barbital and neoarsphenamine. The drug should be continued to be used in conservative dosage by physicians who can evaluate its virtues and dangers.

S. S. LICHTMAN, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

TREATMENT OF ITCH DUE TO VARIOUS CAUSES

To the Editor:—For several years I have been called to treat patients afflicted with a severe itching of the skin. The only sign of the malady is a small papule about the size of a pinhead, which is either raw or reddish brown and apparently has had its top scratched off. The papules are thinly scattered over the arms, legs and trunk. I have never seen them on the head, face, palms or soles of the feet. The condition affects all ages and both sexes, is apparently contagious and is seen most often in the spring and autumn. Phenolized ointments relieve the itching, and after prolonged use the trouble disappears. I should like a prompt remedy, if you can so favor me. Please omit name.

M.D., Montana.

ANSWER.—The brief description suggests (1) scabies of human or animal origin, (2) pediculosis vestimentorum or bird pediculosis, (3) straw mite itch and (4) trombidiasis—leptus, mowers' mite, harvest bug.

1. The typical lesion of scabies is a papulovesicle and not a papule which has "apparently had its top scratched off," though many such scratched lesions may be seen. The burrow of scabies is often difficult to find. Localization of the eruption about the anterior axillary folds, the female breast, the male genitalia, the webs of the fingers and on the buttocks of those who sit at work is a more obvious characteristic. Discovery of the mite, its feces and eggs in a thin slice of epidermis about and including the papulovesicle is the final proof.

Scabies of animal origin is rare and can be eliminated in an epidemic as described.

The treatment of human scabies is the use of Danish ointment for twenty-four hours, applying it after a good soaking bath with hot water and soap, with care that all the skin, from the neck down to the ends of the fingers and toes, is covered by the ointment. Then the patient dons the underwear already worn. In twenty-four hours another good bath is taken, with a change of underwear, night cloths, sheets, pillow cases and careful sterilization of all clothing that has been in contact with the skin during the course of the disease. All in the family, whether infested mildly or severely, must be treated at the same time. If Danish ointment fails to clear up the disease (do not mistake secondary dermatitis due to scratching or the irritation of the ointment for scabies), a four day course of the old fashioned formula 10 per cent each of precipitated sulfur, chalk, green soap and Peruvian balsam in petrolatum will probably succeed. The cleanup is the most important part of the treatment.

2. Pediculosis vestimentorum is manifested by papules topped by blood crusts, blood crusts flat on the skin, scratch marks and secondary dermatitis, most marked in the areas in which the clothing is tight. It is proved by the discovery of the louse in the seams of the clothing. Treatment consists of bathing and sterilization of all clothing.

Bird louse dermatitis resembles scabies, occurring as an eruption of discrete papules, though not in the typical preferred areas of scabies, and without burrows or organisms in the skin, on it or in the clothing. The louse retires, after feeding, to the cage or hen house or pigeon house, where it may be found in the crevices. Careful cleansing of the hands after care of the birds and removal of their cages from the vicinity of the patient will cure. It is not likely that this would occur in epidemics such as described.

3. Straw itch is caused by a small mite found in the dust from grain or straw. It attacks those who work with grain or who sleep on straw mattresses. The skin lesions are small wheals with central vesicles, on the neck, trunk and limbs. The hands and feet are seldom involved. Larger lesions sometimes occur, vesicles up to 0.3 cm. in diameter. Chills and fever, malaise and anorexia may initiate the attack. Itching is more severe at night. A bath, sterilization of the clothing and avoidance of contact with grain or straw dust should cure; for the fever, rest in bed and a mild sedative.

4. The harvest mite, leptus, is a larva, from brick to vermilion red, which becomes active from April to July, depending on the latitude and elevation. It is more common in dry summers, is present on grasses and underbrush, and attacks the feet and legs commonly, but it may also be found on the legs or trunk and less on the arms. Women and children are more susceptible than men, perhaps because their legs and feet are less protected. The lesions are follicular papules with the red mite showing in the center. Later they become hemorrhagic. They occur particularly where the clothing is tight enough to stop the travel of the mites, at the shoe tops, under garters or at the belt line and may increase in number for a day or so after infestation, but there may be a second crop three or four days after the first one. The disease subsides spontaneously in three or four weeks.

The treatment consists of a bath and application of 6 per cent oil of peppermint, rosemary or pine needles in an ointment and a change of clothing, including the garters. The clothing should be sterilized.

SUBCUTANEOUS OXYGEN THERAPY—RASH DUE TO LAMB'S WOOL

To the Editor:—Inquiries have been made regarding the subcutaneous injection of oxygen to replace the tent or catheter method. I would appreciate a working knowledge of this method of therapy. I have in the past months treated two cases of rash, seemingly attributable to "genuine lamb's wool" fur. In one case, only the neck was involved, the person having only that type of fur collar on the coat she was wearing. The other patient, a boy of 12, developed a generalized urticarial rash with angioneurotic edema of the scrotum and foreskin, after wearing an overcoat lined with this material. Perhaps you could help me in determining the exact dye or irritant causing this reaction. The name "genuine lamb's wool" seems to be a trade name. In both instances, the color of the fur was dark brown. Please omit name.

M.D., Wisconsin.

ANSWER.—The simplest method available for subcutaneous oxygen therapy uses an inflated rubber bag containing from 400 to 500 cc. of oxygen. A large needle on a syringe is inserted into the subcutaneous tissues of the abdominal wall. Suction is made on the syringe to make sure that the needle is not in a vein, and the syringe is removed, leaving the needle in place. The rubber bag is connected with the needle by means of rubber tubing and an adapter. A stopcock on the tubing is opened. The bag is gently compressed and the oxygen introduced into the subcutaneous tissue. If the rate of absorption is rapid, 1,000 cc. or more may be injected. If the rate of absorption is slow, multiple areas may be used for injection. Injections may be given twice a day. There are two complicated special appliances on the market for this method, namely, the "oxygenateur" by Dr. Bayeaux of Paris and the Loth apparatus, Utrecht, Netherlands.

The skin manifestations described may be due either to the effect of wool or to the effect of aniline dye or even to the effect of some other antigenic substance not suspected by the patient. If wool is responsible, the more unrefined it is, the more troublesome. A patch test done with undyed wool, if negative after twenty-four hours, would indicate the possibility that the aniline dye mentioned is a cause for the skin condition. The variability of the composition of dyes precludes, in most cases, tests with them, so that a diagnosis by the process of elimination is frequently necessary.

THROMBOPHLEBITIS AFTER CESAREAN SECTION

To the Editor:—There seems to be little definite information in the current literature as to when it is safe to start movements, active and passive, of a limb following thrombophlebitis with embolic phenomena. Eight weeks ago, following a massive hemorrhage, I elected classic cesarean section in a case of placenta praevia centralis because the child was still viable and I feared that a Braxton Hicks maneuver would destroy the baby. The postoperative course was uneventful and on the fourteenth day there were sudden signs of a pulmonary embolism with infarction. After the use of sedatives for a week the embolic signs and symptoms subsided and the left thigh became swollen and tender along with abdominal distention, sudden hemorrhoids and bladder irritability, which I assumed were due to deep pelvic thrombosis involving the left common iliac vein and the perirectal and prevesical veins. Blood culture was negative. The temperature has remained normal or subnormal but there has been a tachycardia (110-110) for six weeks, ever since the first embolic phenomena, which I assume is due to a low grade toxemia, though the last white cell count is only 6,400 with 74 per cent neutrophils. The treatment to date has been elevation of the limb, dry heat and sedatives. After six weeks of such management (just when the prognosis seemed fair), there was another pulmonary embolism almost as severe as the first. There have been many small showers in the interim. The external saphenous vein is just now becoming involved. What is the present status of citrate solution intravenously? Is surgical ligation of the iliac vein advisable to prevent further emboli? I fear that the thrombosis may extend into the inferior vena cava. When would you chance passive motion? When active motion? Why has no lung abscess developed after all these septic pulmonary emboli? Peham and Amreich recommend six weeks of bed rest after all signs and symptoms are absent. Can you cite other authorities?

M.D., Nevada.

ANSWER.—There is no inflexible rule for the management of patients with thrombophlebitis. Rest in bed, immobilization and elevation of the affected limb and repeated applications of hot, wet packs are advisable. Ordinarily, active motion may be allowed safely a few days after tenderness to pressure over the vein, systemic fever, and edema have disappeared, provided there is no clinical evidence of extension of the inflammatory lesion. In the usual case of thrombophlebitis the period of confinement of the patient to bed need not exceed two weeks. Long periods of inactivity are not only unnecessary in the usual case but tend to produce neuroses centering on the affected limb, especially when patients were psychopathic or neurasthenic before phlebitis occurred.

The incidence of fatal pulmonary embolism resulting from phlebitis is very small apparently because the inflammatory process has anchored the thrombus to the wall of the vein. However, pulmonary infarction is not uncommon but it is rarely followed by lung abscess. The explanation for this is not clear. Perhaps bacteria, if present in the thrombus, are not viable in the lung. The case cited by the correspondent is unusual. Continued rest in bed, immobilization of the limb, and the application of heat are advisable. The intravenous injection of a solution of sodium citrate is not of recognized value. Ligation of the iliac vein is rarely indicated. The operation itself is additional cause for thrombophlebitis, and there is no good evidence that the ligature would prevent extension of inflammation. Thrombosis of the distal inferior vena cava is not ordinarily serious. Treatment after the inflammation is quiescent; namely, adequate support to prevent edema must be applied to two extremities instead of to one if thrombosis of the vena cava occurs.

RELATIVE EFFICIENCY OF SEDATIVE DRUGS

To the Editor:—Can you give me an approximate idea of the relative rapidity of the various commonly used sedatives (given in their average dose) and also their relative duration of action? It is my impression that, in general, the rapidity of action is inversely proportional to the duration of the effect. I am interested chiefly in the barbituric acid derivatives, but I would also like to know how other sedatives, such as bromide, chloral and bromural, compare with them. Kindly omit name.

M.D., Connecticut.

ANSWER.—The barbituric acid derivatives may be divided into those of prolonged and those with short action. Thus, pentobarbital sodium and pernocton belong to the agents of relatively short action (from three to six hours) and phenobarbital and barbital to those of enduring action (from six to eight hours), with amytal and cyclohexenyl ethyl barbituric acid ranging somewhere between these. The proposition that the more rapid the onset of action the shorter the effect may seem to be borne out by the rapid onset of the action of most of the rapidly acting barbiturates: e. g., the fact that the action of pentobarbital and cyclohexenyl ethyl barbituric acid sets in earlier than with most of the other barbiturates, the effect of which is in general secured within half to three quarters of an hour. This relation is, however, not essential, as the onset of action depends on rapidity of absorption, which in turn depends on a water and lipoid solubility factor as well as possible dissociations in the organism. The duration of the effect, on the

other hand, depends on the rapidity of destruction in and elimination from the organism. In the agent of brief action a destruction occurs so rapidly that it is completed over night, while barbital is eliminated slowly and largely unchanged, so that with full doses there is often a certain degree of depression experienced the next day and there is liability to cumulative action. The hypnotics of short duration may initiate a sleep, which then continues throughout the night even though the action of the narcotic itself has ceased. If the patient awakens too early, a hypnotic of more prolonged action is indicated. Chloral hydrate acts rapidly, within fifteen minutes, so that it may be given just as the patient goes to bed, while the barbiturates are better given from half to three quarters of an hour before bedtime. As chloral hydrate in moderate dosage is rapidly eliminated, it does not produce sleepiness the next day. Bromide action is slow in onset. It is not a true hypnotic. It merely lessens reflex excitability and restlessness and thus favors sleep but does not force it on the individual as do the true hypnotics. As it is slowly eliminated, its effects are rather enduring. Bromural is also a sedative rather than a narcotic; it produces sedation and slight sleepiness within half an hour and this may suffice to induce sleep in mild cases of insomnia. Its real action continues for about three to five hours; but, as before stated, sleep once induced may continue longer.

EFFECTS OF OVARIECTOMY

To the Editor:—Please advise me what the untoward symptoms are following the removal of both ovaries. Is intermittent sweating, marked, one of them? If so, what would be the suggested dose of theelin in oil? What would be the interval and the probable duration of such treatment? Please use initials only.

M.D., Alabama.

ANSWER.—In a woman of menstruating age, removal of both ovaries produces a surgical menopause with the possibility of having menopausal symptoms of varying degree. The intermittent sweating, hot and cold flashes and feeling of tiredness may in some cases be quite marked, while in other cases they may be slight or even absent.

It has been found that treatment with estrogenic substance together with the oral administration of bromides acts in many instances to alleviate or completely relieve the annoying symptoms. The estrogenic substance is best used in an oil solution, 2,000 rat units per cubic centimeter administered in deep intramuscular injections once a week. Any of the ethically produced and standardized products may be used. It may be necessary to carry on such treatments over a period of many months or until such a time as the menopause is well established and the vasomotor disturbances accompanying its onset have subsided. The bromides act to cut down on the patient's nervous irritability and to decrease the reaction to the vasomotor stimuli.

It must be remembered that it is possible for the patient to have conditions not associated with the genital tract which may be responsible for the discomfort or add to it. Because of this, hypertension, cardiac disease, renal insufficiency and blood dyscrasias must be ruled out before one can extend hope for improvement by hormone replacement therapy plus the use of sedatives.

GAUZE SPONGE IN PERITONEAL CAVITY

To the Editor:—As a search through standard textbooks and reference works on surgery has been unsatisfactory, would you kindly inform me regarding the symptoms caused by a gauze sponge left in the peritoneal cavity? Could such a foreign body in this location give no signs or symptoms for a period as long as three months postoperatively? Might three sponges be lost in the peritoneal cavity of a moderately obese woman and give no signs or symptoms? Please omit name.

M.D., Minnesota.

ANSWER.—In most instances in which sponges have been removed after being left in the abdomen the symptoms were the result of suppuration.

It would seem impossible to differentiate irritation by a foreign body from localized peritonitis following operation. Pressure symptoms that not infrequently affect the bladder are usually due in either instance to an abscess. The chief differentiating symptoms are that in postoperative peritonitis there is acute inflammation with tympanites, while with a foreign body there may be few or no symptoms until secondary infection develops.

Provided suppuration does not develop, the early symptoms of irritation and pressure which might simulate those after any laparotomy could subside either completely or partially. In the latter instance any persisting symptoms might simulate adhesions which might follow a low grade infection that had subsided.

In the event of infection developing about a gauze sponge or foreign body, suppuration would persist until the foreign body had passed out or was removed at a subsequent operation.

One or even three small sponges might remain in the abdomen three months or longer with no symptoms, provided their size did not produce pressure symptoms and they did not become secondarily infected.

In the course of several hundred operations on animals it has been observed on several occasions in which sterile gauze sponges were left at a previous operation weeks or months before that these sponges were completely surrounded by omentum with no suppuration or surrounding adhesions. There were no symptoms due to the presence of these walled-off sponges. It is possible that animals may tolerate foreign material better than human beings. No doubt the size of the sponge is of importance as well as the size of the omentum that may be available for surrounding it and preventing contact with the intestinal wall, through which infection may come.

In the presence of a large omentum there would be a better chance for it to wall off a gauze sponge without the development of secondary infection or other symptoms.

INJURY TO ROOF OF MOUTH IN REMOVING TOOTH

To the Editor:—A woman, aged 23, single, suffering pain in a tooth due to a cavity, saw her dentist. He noted the cavity in the left molar and advised its removal. This was done. There was no abscess or other evidence of infection on this tooth when removed. As the dentist was removing the tooth, the patient noticed a sharp pain in the roof of her month. She called his attention to this. He told her there was a slight laceration of the roof of the mouth; whether due to scratching with the tooth as he was removing it or to the instrument (dental forceps), he did not know. This occurred Aug. 14, 1935. I was called that evening and noted the laceration extending over the right posterior palate, which the patient said was painful. I advised hot irrigations. The dentist was consulted. He said that rinsing the mouth would be sufficient. This was done August 17. The girl was unable to open her mouth. She suffered pain in the roof of the mouth and in her neck. I again advised hot irrigations and also fomentations to the neck. On the 19th, at the request of the dentist, she used antiphlogistine externally. That night the pain was intense. A hypodermic did no good. No improvement had occurred on the 20th. She had a temperature of 103.2 F. At 7 p. m. August 22 she had a severe chill. I removed her to the hospital and gave a citrated blood transfusion. For two days she had a septic temperature. Drainage then began from her mouth. The fever subsided by lysis. Drainage coming from the roof of the mouth continued for nearly two weeks. The question arose as to how an abscess could develop on the palate. It was generally believed to be due to the trauma; i. e., the laceration. However, the dentist says that the drainage from the tooth socket moved backward, up the pillars and fauces to the palate. Does this occur? My impression as to drainage is in a direction opposite to this, the drainage being into the submaxillary and deep cervical glands. Kindly omit name.

M.D., Connecticut.

ANSWER.—It would seem unlikely that the acute infection described was due to any other cause than the injury to the roof of the mouth and the bacterial invasion through this portal of entry. The normal course of lymph drainage from both of the regions mentioned is toward the upper deep cervical lymph nodes; from the palate region by way of nodes along the internal maxillary artery and from the lower molar zone by way of submaxillary channels. Only in cases of blocked drainage can the lymph flow be reversed. In this case the first evidences of inflammation were in the palate, and extension was along the normal paths for drainage without involvement of the extraction site and the regions next in line. Consequently there is no reason to believe that drainage was blocked and that infection extended from the extraction socket to the roof of the mouth by way of the pillars and fauces.

OPERATIONS FOR OCCLUSION OF FALLOPIAN TUBES

To the Editor:—My daughter-in-law is 30 years old; five years ago she gave birth to a son. Everything was normal. She has had no children since. Examination shows occlusion of both tubes near the fimbriated ends. She is in perfect health and desires more children. Unfortunately an operation seems the only way out. My son was home from Ohio and consulted me about it but I am not in a position to give him any advice. I want, therefore, to ask you: What percentage of these operations is successful? Can you give me the names of any surgeons in Cleveland, Cincinnati, Pittsburgh or other cities in that neighborhood where this work has been successfully done?

M.D., Minnesota.

ANSWER.—Operations for relief of sterility ascribable to occlusion of the fallopian tubes are satisfactory in not more than one third of the cases. Obstructions limited to the fimbriated ends of the tubes offer a somewhat more favorable prognosis.

Before resorting to surgery the fertility of the husband should be determined, despite the fact that he is the father of a healthy child 5 years of age. He should also be questioned relative to the possibly of having acquired a gonorrheal infection, the most common cause of bilateral tubal occlusion.

Most authorities advocate radiography of the tubes prior to operation, although some are content with a Rubin test. Instillation of iodized oil and radiography give more detailed information than a Rubin test, but some hesitate to use it as a routine procedure because of the possibility of lighting up an infection.

It is inappropriate to recommend in THE JOURNAL the names of any individuals. Through the leading hospitals and medical schools one can readily obtain the names of competent gynecologists.

FASCIA STAIN

To the Editor:—I need to know of a stain that will stain fascia only. This stain should not stain muscle, fat, nerve or anything but fascia.

T. E. ZINKAN, M.D., San Jose, Calif.

ANSWER.—There is no known stain that will stain fascia only. There are several stains that will differentiate connective tissue or elastic fibers from other structures. The most useful are the following:

A. *Mallory connective tissue stain.* The connective tissue stains deep blue, nuclei red.

1. Remove paraffin with xylene.
2. Absolute alcohol.
3. 95 per cent alcohol.
4. 80 per cent alcohol.
5. Wash in water.
6. Zenker's solution twenty-four hours (if not Zenker fixed material).
7. Aqueous solution of iodine (Lugol's solution) fifteen minutes.
8. Decolorize with 5 per cent solution of sodium thiosulfate for thirty seconds.
9. Wash thoroughly with distilled water.
10. 0.5 per cent aqueous solution of acid fuchsin two minutes.
11. Wash in distilled water.
12. 1 per cent phosphomolybdic acid one minute.
13. Transfer directly to Mallory's stain from two to four minutes.
14. Wash with 95 per cent alcohol.
15. Dehydrate with several changes of 95 per cent and absolute alcohol.
16. Clear in xylene.
17. Mount in balsam.

B. *Van Gieson's stain for connective tissue.* The connective tissue is deep red; the nuclei are black.

1. Fixation in almost any fixative.
2. Remove paraffin, and so on, as usual.
3. Mix Heidenhain's iron hematoxylin solution 1 with equal parts of No. 2. Stain from four to five minutes.
4. Wash in distilled water.
5. Van Gieson's picric acid fuchsin one minute.
6. Dehydrate.
7. Clear in xylene.
8. Mount in balsam.

C. *Weigert's elastic tissue stain.* Elastic tissues are from dark blue to black, the nuclei stained lightly with carmine. Formaldehyde fixation is preferred.

1. Remove paraffin with xylene.
2. Absolute alcohol.
3. 95 per cent alcohol.
4. 80 per cent alcohol.
5. Distilled water.
6. Place in 1 per cent safranin for twenty-four hours or in an incubator from three to five hours.
7. Wash in absolute alcohol.
8. Elastic stain from five to twenty minutes (use microscope).
9. Rinse several times in absolute alcohol.
10. Clear in xylene and mount in balsam.

STREPTOCOCCUS CARRIER AND OBSTETRICS

To the Editor:—A helper in a hospital constantly shows streptococcus in smears from her throat. A culture sent to the state laboratory was reported staphylococcus only. She had her tonsils thoroughly removed a few years ago. Would you consider it dangerous to have her working around the obstetric department? What can be done to clear up the condition? She has been given streptococcus serum and has been using mild antiseptics in her throat. Please omit name. M.D., Minnesota.

ANSWER.—If streptococci persist in the helper's throat in spite of local and general treatment, it is best to have her stay away from the obstetric department. There is always the possibility that at some time or other the streptococci may become virulent, especially during the winter months, and the helper may then become a direct cause of infection. If the helper should constantly wear a mask which would cover not only her mouth but also her nose, the risk of infection would be reduced considerably but there would still be the danger of contamination from her hands. The risk should not be taken, especially when it ought to be possible to employ the helper in some kind of work in a part of the hospital where there is no danger of infection.

TUBERCULOUS LYMPHADENITIS

To the Editor:—A woman, aged 30, married, with two children, weighs 155 pounds (70 Kg.), appears healthy and has no complaints except swellings on the side of the neck. She had swollen glands in the right cervical region five years ago resulting in two abscesses, which required incision and took about four months to heal. During the past five years the glands have become enlarged occasionally but have not resulted in abscesses. In January 1935 a swollen gland developed on the left side of the neck, which required incisions and which healed in five months. In August 1935 swelling developed on the right side, which was incised and is still not healed but has a small scab, which on removal disclosed a granulating area with some discharge. At this time, December 1935, she has two other swellings on the right side of the neck, which are not very tender, are apparently adherent to the skin and are quite movable. Blood examination reveals 74 per cent hemoglobin, 3,900,000 erythrocytes, 5,600 leukocytes, 33 per cent neutrophils, 1 per cent myelocytes, 50 per cent lymphocytes, 8 per cent mononuclears, 6 per cent eosinophils, 3 per cent basophils, 11 per cent staff cells, 21 per cent segmented forms. Examination of the urine gives negative results. The blood Wassermann reaction is negative. The tuberculin test with 0.001 cc. of old tuberculin is positive. The basal metabolism is 16 per cent. Roentgen examination of the teeth and of the chest gave negative results. During the past four months the patient has been advised to rest more frequently, to drink cod liver oil and milk and to take dicalcium phosphate, one tablet twice daily. She has gained 10 pounds (4.5 Kg.) on this regimen, yet the swollen glands have come again. Is there anything else that can be advised? I have assumed a diagnosis of tuberculosis adenitis. Can it be anything else? I have now advised general ultraviolet therapy twice weekly, also local heliotherapy. What is the opinion regarding these measures? Please omit name.

M.D., New York.

ANSWER.—The clinical history and the laboratory examinations are both typical of a tuberculous lymphadenitis. There is one other possibility and that is a superimposed Hodgkin's disease. This should be determined by a biopsy with a pathologic and bacteriologic examination.

If it is found to be only tuberculosis, the treatment should be aimed at a progressive tuberculous lymphadenitis: relative rest periods, removal from the responsibility of care of the children and household, and a balanced and adequate diet, including vitamins. This has apparently been done. Ultraviolet therapy administered in progressive dosage is indicated as well as progressively administered heliotherapy, if there is adequate sunlight. The latter need not be strictly local. The trouble with sunlight is its inconstancy. In most parts of the United States there is so much fluctuation of light that the advantages from such methods are little or nil. Measured ultraviolet radiation is much to be preferred, because it can be measured and given in accurate and proper dosage.

TREATMENT OF EARLY SYPHILIS

To the Editor:—Printed in a copy of "Modern Medicine" in December 1934 was Friedman's Ready Reference tables for the treatment of early syphilis. In case you have no reference, it goes as follows: one week of neoarsphenamine 4.5, 0.5 and 0.6 Gm.; second week, neoarsphenamine 0.6 Gm.; third week, 0.1 Gm. of a bismuth compound and neoarsphenamine 0.6 Gm. End of course one; seronegative primary syphilis. From the fourth to the eighth week, a bismuth compound and neoarsphenamine. From the ninth to the seventeenth week, a bismuth compound. So it goes on in alternate, nonrest periods, courses through course five. What I should like to know is whether this may be considered authoritative? Second, the entire course of treatments would take eighty-one weeks. Is less than this justifiable? Please omit name. M.D., Virginia.

ANSWER.—The article by H. L. Friedman entitled "Early Syphilis—Diagnosis and Treatment Graphically Represented" was published also in *Colorado Medicine* (**31**:353 [Oct.] 1934). The course of treatment outlined by Dr. Friedman may be regarded as adequate. It differs in certain minor respects from the standard treatment procedure suggested by the Cooperative Clinical Group (THE JOURNAL, April 21, 1934, p. 1267). These differences are as follows:

1. The dosage of neoarsphenamine should be from 0.45 to 0.6 Gm. for women and from 0.6 to 0.75 Gm. for men. Nothing is gained and something probably is lost by starting treatment with smaller doses than these. There is no adequate reason for starting the treatment of early secondary syphilis with bismuth compounds. In all stages of early syphilis, treatment is more properly initiated with an arsphenamine.

2. The preparation of bismuth utilized by Dr. Friedman is not mentioned, and the dosage suggested (from 0.1 to 0.15 Gm.) is a trifle small. An adequate dose of the preferable insoluble bismuth salicylate is 0.2 Gm.

3. The treatment of seropositive primary syphilis should be at least as long as that of early secondary syphilis.

4. The total duration of treatment, as outlined by the group, is approximately ten weeks shorter than that suggested by Dr. Friedman.

5. The after-care of treated patients should not cease with a three to five year observation period but should be prolonged throughout the patient's lifetime.

The essential feature of the treatment plan suggested by Dr. Friedman is, however, the same as that outlined by the Cooperative Clinical Group; namely, that the treatment of early syphilis shall be continuous throughout, with no interpolated rest periods of any sort.

EDEMA IN DIABETES

To the Editor:—A woman, aged 42, who has had diabetes for four years but has been under management for only one year, complains of edema of the lower extremities during the day. This disappears at night but appears in the hands, arms and face in the morning. She states that her eyes are swollen so badly that she can hardly open them at times. Last Christmas she was in the hospital for diabetic coma. During the past summer she developed an infection in her thigh as the result of insulin administration. Since this episode she has had this edema. The output of urine is diminished. She has menstruated only once in the last six months, in October. At this time edema disappeared for about ten days. She is taking about 30 units of insulin daily and showing some sugar, but she was sugar free this fall and the edema was unaffected. She is on a diet of 65 Gm. of protein, 135 of fat and 85 of carbohydrate. No urinary, cardiorespiratory, digestive or nervous symptoms are apparent. The physical diagnosis and examination are essentially negative except for marked pitting edema from the midthigh down on both extremities. Hemoglobin is 70 per cent; the urine contains 0.2 per cent of sugar but no albumin. Can this be a nutritional edema from mineral deficiency? If not, what are other possibilities? What treatment is there? Please omit name.

M.D., Iowa.

ANSWER.—The fact that this edema affects not only the legs but also the arms and the face and that the infection mentioned developed in only one thigh makes it unlikely that the infection is responsible for the edema. The absence of menstruation might be due to an early menopause but also suggests that dietary deficiency is a factor in this edema. The present diet may be inadequate in calories but seems to be supplied with enough protein and therefore does not seem responsible for the trouble. Mineral deficiencies rarely if ever cause such edema. Essential for the diagnosis would be a determination of the total proteins of the blood plasma as well as the relative amount of serum albumin and serum globulin. A low protein content of the blood plasma, particularly a low albumin content, would support the diagnosis of nutritional edema.

HIGH VITAMIN ACID ASH DIETS IN URINARY INFECTION

To the Editor:—What is the rationale of the high vitamin acid ash diet in infections of the urinary tract? Why is sodium chloride so strictly prohibited in this diet? Should the diet consist exclusively of foods that have acid ash or may the diet be supplemented by basic or neutral foods? Isn't it an incongruity that everything that is prepared with salt is tabu? The diet lists allow American cheese, Cheddar cheese and frankfurters; all these foods have a large percentage of salt. Where can I look up this subject in detail? Where am I to get a complete table of foods generally consumed, as to their ash reaction, whether acid, basic or neutral?

ROBERT FISHER, M.D., New York.

ANSWER.—The rationale of the high vitamin A-acid ash diet in infections of the urinary tract depends on the production of an acid urine. The inhibition of the growth of bacilli by acid urine dates to the work of Shohl and Janney in 1917 (*J. Urol.* **1**:211 [April] 1917). The contraindication for the inclusion of much sodium chloride in these diets is discussed by Charles Higgins of Cleveland. His most recent report on the subject is in *Surgical Clinics of North America* **15**:923 (Aug.) 1935. Lists of acid and basic foods can be found in "The Chemistry of Food and Nutrition" by Sherman, edition 4, New York, Macmillan Company, 1932, and in "Nutrition and Diet in Health and Disease" by J. S. McLester, Philadelphia and London, W. B. Saunders Company, 1927.

CARCINOMA OF FUNDUS OF BLADDER

To the Editor:—I have a patient who has a carcinoma of the fundus of the bladder. This growth is 5 by 3 cm. in diameter and is a hard mass. The bladder capacity is 2½ ounces. The general condition of the patient is good. Is the prognosis of the patient better by treating him with radium or better by transplanting the ureters into the bowels and removing the bladder? Please omit name.

M.D., Tennessee.

ANSWER.—There still is a good deal of diversity of opinion regarding treatment of carcinoma of the fundus of the bladder. Suprapubic cystostomy with surgical diathermy is the procedure in a great many clinics. Others are of the opinion that the implantation of radium with the cystoscope is the method of elimination. In the third group one finds those who believe in cystectomy and here one finds diversity of opinion: on the one hand are those who believe that the ureter should be implanted into the bowel, and in the other group one finds men who believe that the ureter should be transplanted into the skin and catheters inserted into the ureter.

INTRAVENOUS ALCOHOL AS NONSPECIFIC PROTEIN THERAPY

To the Editor:—Would you send me indications, contraindications, dangers, and the technic of intravenous alcohol preparations in the treatment of suppurating fetid disorders, especially of the lungs? I find many references, all of foreign origin, as for example "Intravenous Alcohol Preparations in Treatment of Suppurating Fetid Disorders" (*Med. Klin.* **30**: 538-543 [April 20] 1934. I find it referred to as the Landon method 33⅓ per cent alcohol.

RAYMOND L. EVANS, M.D., Sayre, Pa.

ANSWER.—One must look on intravenous injection of alcohol (33⅓ per cent) as a form of nonspecific proteotherapy, the alcohol acting as a "denaturant" of the blood protein with which it comes in contact in sufficient concentration. Its indications may therefore be conceived quite broadly, as by Breuer and Aron (*Wien. med. Wchnschr.* **85**:868 [Aug. 3] 1935), who advocate it also in diverse other infectious diseases, such as erysipelas, diphtheria, tonsillitis, scarlet fever, furuncles and phlegmons. Debility so extreme that the patient might not survive the protein shock constitutes the chief contraindication. Cardiac depression is the chief danger, which may be possibly antagonized, when encountered, by intravenous injection of 20 cc. of 33 per cent dextrose and by the usual heart stimulants. The technic requires drawing the alcohol into the syringe without the needle and testing the patency of the needle with sterile physiologic solution of sodium chloride rather than with alcohol. The injection should not be started until blood wells into the needle and should then be made extremely slowly, blood being drawn into the syringe from time to time.

BLOOD VESSELS IN FAT

To the Editor:—In a speech made in Washington in 1924, Dr. K. H. Beall stated that there are about 4,500 feet of blood vessels in each pound of human fat. This speech was published in the *Southern Medical Journal* of May 1924 under the head "The Parasitism of Fat." So far I have been unable to discover any facts that tend to prove or disprove Dr. Beall's statement and I am wondering whether you can shed any light on the subject.

HARRY H. FIELD, New York.

ANSWER.—The length of the blood vessels in one pound of fat, such as exists in the human superficial fascia, has not been definitely worked out. The length of blood vessels in one pound of human skeletal muscle has, however, been estimated approximately (Krogh: Anatomy and Physiology of Capillaries, 1924, p. 10). Krogh's calculations would indicate that in one pound of muscle (human) the length of blood capillaries is approximately 568 miles.

Vascularity of fat is great, though apparently less than that of muscle. In a kitten in which the blood vessels were injected with carmine gelatin and preparations made in identical manner of muscle and of fat from the mammary gland, the blood vessels in the muscle tissue were apparently five times as numerous as the capillaries in the fatty tissue. (This is a rough approximation.) Assuming that the same proportion exists in the human animal, the length of capillaries in one pound of fatty tissue would be a little over 100 miles.

ETIOLOGY OF PALPITATION

To the Editor:—Is the onset of palpitation (pulse average 84) following (1) small amounts of alcohol, (2) smoking a cigaret, (3) slight effort, (4) ephedrine and epinephrine used as sprays, (5) one-half grain (0.03 Gm.) of thyroid extract ingested, in a person aged 30, with no other physical sign or laboratory finding of heart disease, evidence of occult heart disease? The palpitation is visible and easily felt, and lasts from minutes to hours. During this period there is frequent sighing and marked weakness. Omit name place.

M.D., New York.

ANSWER.—Palpitation is the consciousness of the heart's action, whether fast or slow, regular or irregular. It may be a disagreeable sensation and in a nervous or sensitive person become quite distressing. The sensation is one of pounding or thumping but sometimes there may be fear, weakness, pain or even dyspnea.

The commonest cause of palpitation is a simple increase in the rate and force of the heart beat under the influence of exertion or excitement. Fatigue, infection, neurocirculatory asthenia, thyrotoxicosis, and in some persons tea, coffee, tobacco, alcohol, epinephrine or ephedrine, or procaine hydrochloride for local anesthenia frequently cause the heart to beat harder and faster. Palpitation is especially likely to occur during convalescence from illness that has no organic effect on the heart.

There are other causes of palpitation, such as the abnormal tachycardias, paroxysmal tachycardia, auricular fibrillation or auricular flutter. In a patient aged 30 with no other physical signs or laboratory signs of heart disease palpitation does not itself indicate the presence of any disease. A basal metabolic rate determination would be advisable to exclude thyrotoxicosis. An electrocardiogram during the attack will reveal the presence of any abnormal tachycardia. Alcohol, tobacco, coffee, ephedrine, and thyroid extract may cause palpitation in healthy persons without indicating the presence of organic heart disease.

REACTION TO SULFARSPHENAMINE IN SYPHILIS

To the Editor:—A white woman, aged 42, weighing 205 pounds (93 Kg.), was found to have a 4 plus Wassermann reaction. This was discovered when the patient presented herself with an ulcer in her nose. I immediately put her on one weekly injection each of bismuth salicylate intramuscularly and sulfarsphenamine 0.4 Gm., also intramuscularly. Owing to the patient's overweight, intravenous injections are difficult. After three weeks' treatment the nasal ulcer healed but the patient began to have attacks of nausea and gagging immediately following the sulfarsphenamine injections. These attacks last for half an hour; afterward she feels well and has no complaints. What is the cause of these attacks. Is faulty technic to blame? I follow exactly the directions given. What can be done to prevent these attacks? Should the injections be discontinued? The patient begins to dread the sulfarsphenamine and wishes to be treated only by bismuth compounds, which I do not consider sufficient. So far she has received seven injections of each chemical.

M.D., New Jersey.

ANSWER.—The nausea and gagging that appear following the intramuscular injection of sulfarsphenamine may be attributable to a psychic effect, a nitritoid reaction, or one of the mild gastro-intestinal upsets that follow injections of arsenic. As a rule, intramuscular injections do not produce pronounced psychic reactions. The nitritoid reactions from intramuscular injections of sulfarsphenamine usually appear four or more hours after the injection, although such reactions have been reported as appearing immediately or up to half an hour after the injection. The nausea and gagging that this patient encountered is probably the result of an idiosyncrasy to the drug. Accordingly, faulty technic is probably not a factor. It would seem advisable to try another intramuscular preparation such as bismuth arsphenamine sulfonate, bearing in mind that this contains sulfarsphenamine, and if a reaction is noted following it, further use of intramuscular preparations would not seem warranted. In view of the difficulty of intravenous injections it would probably be necessary to limit the treatment to the use of intramuscular injections of a bismuth preparation, giving the patient probably twenty injections to a course at least twice a year for a minimum of three years.

IRON PRESCRIPTION NOT RELATED TO CARIES

To the Editor:—In March 1935 I prescribed this treatment for a patient with secondary anemia:

℞ Ferri et ammonii citratis..... ʒ ss
Syrupi auranti ..... ʒ ss
Aquae, q. s.....ad ʒ i

Sig. Two teaspoonfuls in a little water after meals.

This was refilled several times. During the following summer and fall caries of the teeth developed, requiring extensive dental repairs. The patient is firmly convinced, and her dentist supports her in this conviction, that the iron prescription was responsible for the damaged teeth. Please inform me whether there is any evidence to support such a theory of tooth decay.

M.D., New York.

ANSWER.—The iron prescription referred to, being free from corrosive acid, could not possibly have produced dental caries. It must have been due to some other cause.

SEPTIC SORE THROAT AND SCARLET FEVER

To the Editor:—For the past two years there has been a long drawn out epidemic of scarlet fever in this region. Many cases have been and still are being reported as septic sore throat, and I must admit that I find nothing in my books that shows any possibility of mistaking the two diseases. These cases of septic sore throat show a rash over the body which in my opinion is scarlet fever. What I wish to learn is whether or not septic sore throat gives a generalized skin rash and also what the differential diagnostic points are of each disease. I would prefer having my name omitted.

M.D., Wyoming.

ANSWER.—In epidemics of septic sore throat, occasional rashes are reported. These are usually erysipelas, but transient generalized rashes may occur. Dr. D. J. Davis has shown that septic sore throat is caused by a hemolytic streptococcus which produces a toxin that is weak in comparison to scarlet fever toxin and is not neutralized by scarlet fever antitoxin. In case a generalized rash appears, the diagnosis may be made by means of a blanching test with scarlet fever antitoxin. In selecting antitoxin for this purpose it is important to choose a preparation that contains no erysipelas or septic sore throat antitoxin. Some of the commercial preparations are taken from horses which have been immunized with more than one kind of hemolytic streptococcus toxin, so that the serum contains more than one kind of antitoxin, although at present it is not so labeled.

USE OF SNAKE VENOM IN CARCINOMA AND IN HEMORRHAGE

To the Editor:—Will you kindly forward to me what information you have as to the use of snake venom in the control of pain, as in carcinoma, when morphine has lost its control and again the use in controlling hemorrhage, as in prostate or bladder hemorrhage.

M.D., Illinois.

ANSWER.—There is no evidence that snake venom is of value in the control of pain associated with cancer.

Snake venom has been used in idiopathic bleeding of various kinds. It is apparently effective in nasal bleeding in cases with actual local vascular changes such as are found in Osler's disease and even in the presence of erosions (Peck, S. M., and Rosenthal, Nathan: Observations on the Effect of Moccasin Snake Venom in Hemorrhagic Conditions, THE JOURNAL, (March 30, 1935, p. 1066). It has also been used in cases of gastric and urinary hemorrhage by Dr. Peck with apparently beneficial results in a number of cases. Since it can be given in daily doses of 1 cc. without any harmful effects, there is no contraindication to its use in the type of case inquired about. The initial dose should be 0.5 cc. of the 1:3,000 dilution (supplied by the Lederle Laboratories), rapidly increased to a maximum dose of 1 cc. daily until the hemorrhage has been controlled. After that the number of injections per week can be reduced until the proper maintenance dose is reached and the proper therapeutic response obtained. A detailed description of doses is given in the report mentioned.

TREATMENT OF HYPERHYDROSIS

To the Editor:—I have a patient whose chief complaint is of extremely profuse and debilitating night sweats. She has at the present time practically no other complaint. Several months ago she underwent a pelvic operation, with a rather stormy postoperative course. One ovary was removed but one remains and her endocrine system is otherwise in good order, so far as one can tell. Her blood pressure is normal. Her heart function is good. She does not have any fever, is in a fairly good state of nutrition, and is more or less actively engaged as a nurse. She has been somewhat subject to these sweats at intervals for years, but during the past few months they have been worse than heretofore. Changes in the ventilation of the bedroom, the amount of bed clothing used, and so on, seem to be entirely ineffective. Can you suggest anything in the way of treatment? Please omit name.

M.D., Kentucky.

ANSWER.—Hyperhydrosis is symptomatic of neurasthenia, anemia, obesity, general debility, or a combination of these. The patient may require as etiotropic regimen, some form of rest cure or other change in her mode of living. She may need iron and arsenic, and/or a reducing diet if there is obesity. Roborant treatment, most especially in the form of tonic hydriatic measures, is likely to be of advantage, and sea salt or alum may with advantage be added to the water. Strychnine in liberal doses and atropine in guarded dosage—so as not to produce distress—taken at bedtime may prove to be of temporary value until the more radical measures have had time to act.

KEYSTONE AND SNELLEN TESTS

To the Editor:—In Queries and Minor Notes in THE JOURNAL, January 11, page 147, it was stated that a certain vision testing device "does not exaggerate but rather minimizes the visual acuity as compared with that obtained by using the Snellen chart at 20 feet." Is this based on actual tests? Is there any published article to confirm that statement?

S. H. MONSON, M.D., Cleveland.

ANSWER.—The observation that the Keystone test does not exaggerate the vision is made by a competent ophthalmologist using the test on school children. There is as yet no publication on the subject.

USELESSNESS OF PAINTING THROAT WITH MILD SILVER PREPARATIONS

To the Editor:—Does painting the throat with mild protein silver or neosilvol do any real good in acute follicular tonsillitis? Please omit name.

M.D., New Jersey.

ANSWER.—No, excepting to the extent to which relief is obtained by any cleansing of the tonsillar crypts stopped up with exudate.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALASKA: Juneau, Sept. 1. Sec., Dr. W. W. Council, Juneau.

ARKANSAS: *Basic Science.* Little Rock, Nov. 2. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, Nov. 10. Sec., Dr. A. S. Buchanan, Prescott. *Medical (Eclectic).* Little Rock, Nov. 10. Sec., Dr. Clarence H. Young, 207½ Main St., Little Rock.

CALIFORNIA: Los Angeles, July 20-23. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Medical (Regular).* Hartford, July 14-15. *Endorsement.* Hartford, July 28. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Medical (Homeopathic).* Derby, July 14. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 14-16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, Dover.

DISTRICT OF COLUMBIA: Washington, July 13-14. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

HAWAII: Honolulu, July 13-16. Sec., Dr. James A. Morgan, 48 Alexander Young Bldg., Honolulu.

IDAHO: Boise, Oct. 6. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 205 State House, Boise.

IOWA: *Basic Science.* Des Moines, July 14. Sec., Prof. Edward A. Benbrook, Iowa State College, Ames.

MASSACHUSETTS: Boston, July 14-16. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MONTANA: Helena, Oct. 6. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NEW HAMPSHIRE: Concord, Sept. 10-11. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

NEW MEXICO: Santa Fe, Oct. 12-13. Sec., Dr. Le Grand Ward, Santa Fe.

OREGON: *Basic Science.* Corvallis, July 18. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

PUERTO RICO: San Juan, Sept. 1. Sec., Dr. O. Costa Mandry, Box 536, San Juan.

SOUTH DAKOTA: Rapid City, July 21-22. Dir., Division of Medical Licensure, Dr. Park B. Jenkins, Pierre.

WASHINGTON: Seattle, July 13-15. Dir., Department of Licenses, Mr. Harry C. Huse, Olympia.

WEST VIRGINIA: Bluefield, July 13. State Health Commissioner, Dr. Arthur E. McClue, Charleston.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. *Parts I and II.* Sept. 14-16. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B candidates will be held in various cities in the United States and Canada, Nov. 7. *Applications must be filed at least sixty days prior to the examination.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: New York, Sept. 26. *All applications and case reports must be filed sixty days before date of examination.* Sec., Dr. John Green, 3720 Washington Blvd., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Cleveland, Jan. 9. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, Sept. 25-26. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Baltimore and Cincinnati in November. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 29-30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Cleveland, Sept. 25-27. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

California March Examination

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports the written examination held in Los Angeles, March 10-12, 1936. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. Sixty-three candidates were examined, 58 of whom passed and 5 failed. The following schools were represented:

PASSED			
School		Year Grad.	Per Cent
College of Medical Evangelists	(1932) 84.9, (1934) (1935) 78.9, 83, 83.8, 84.9, 85, 85.8, 86.9		87.6,
Stanford University School of Medicine	(1929) 88.2,	(1935)	85.4
University of California Medical School		(1935)	83, 86.1
University of Southern California School of Medicine		(1935)	85.2
University of Colorado School of Medicine		(1935)	82.1
Loyola University School of Medicine		(1936)	82.2
Northwestern University Medical School		(1927) (1935) 80.8,* 89.6,* (1936) 87.2	79.9,
Rush Medical College		(1932) (1934) 79.9, (1935) 81.3, 85.2, 87.3	86.1,
University of Illinois College of Medicine		(1935)	84.7, 87.6
University of Louisville School of Medicine		(1935)	84.1
Johns Hopkins University School of Med.	(1915) 80.1,	(1932)	85.3
Harvard University Medical School		(1935)	89.2
University of Michigan Medical School		(1935)	83, 85.2
St. Louis University School of Medicine		(1932) (1935) 79.4, 86.9	85.1,
Washington University School of Medicine		(1935)	76.6
Creighton University School of Medicine		(1935) 79.4, 82.1, 83.7, 84.8	78.1,
University of Nebraska College of Medicine		(1934)	85.3
Western Reserve University School of Medicine		(1935)	88.4
University of Oregon Medical School		(1934) (1935) 81.1, 82.7, 83.8	83.2,
Hahnemann Medical Coll. and Hosp. of Philadelphia		(1935)	82.3
Jefferson Medical College of Philadelphia		(1935)	89.4
University of Pennsylvania School of Medicine		(1935)	84.6
Baylor University College of Medicine		(1935)	87.8
Medical College of Virginia		(1935)	84.8
University of Virginia Department of Medicine		(1933)	81.9
University of Wisconsin Medical School		(1935)	82.2, 87.9
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main		(1933)†	78.2
Université de Genève Faculté de Médecine		(1934)†	79.9

FAILED		
School	Year Grad.	Per Cent
University of Arkansas School of Medicine	(1933)	68.6
Meharry Medical College	(1934)	67
University of Dublin School of Physic, Trinity College	(1929)	72
Regia Università degli Studi di Modena. Facoltà di Medicina e Chirurgia	(1932)	73
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1926)	64.3

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

† Verification of graduation in process.

Vermont February Examination

Dr. W. Scott Nay, secretary, Vermont State Board of Medical Registration, reports the written examination held in Burlington, Feb. 11-13, 1936. Eight candidates were examined, all of whom passed. The following schools were represented:

PASSED			
School		Year Grad.	Number Passed
Duke University School of Medicine		(1934)	1
Univ. of Vermont College of Medicine	(1934, 3),*	(1935, 3)*	6
McGill University Faculty of Medicine		(1931)*	1

* Licenses have not been issued.

Tennessee March Examination

Dr. H. W. Qualls, secretary, Tennessee State Board of Medical Examiners, reports the written examination held in Memphis, March 25-26, 1936. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. Twenty-four candidates were examined, all of whom passed. The following school was represented:

PASSED		
School	Year Grad.	Per Cent
University of Tennessee College of Medicine	(1936)	80.4, 81.9, 82.1, 83.1, 83.1, 83.3, 83.6, 83.6, 83.9, 84.1, 84.1, 84.5, 85, 85, 85.1, 85.3, 85.8, 85.9, 86, 86, 86.6, 87.4, 87.9, 87.9

Ten physicians were licensed by reciprocity and 1 physician was licensed by endorsement from January 13 through May 24. The following schools were represented:

LICENSED BY RECIPROCITY		
School	Year Grad.	Reciprocity with
University of Georgia Medical Department	(1924)	S. Carolina
University of Louisville School of Medicine	(1927, (1930)	Kentucky
Tulane University of Louisiana Medical Department	(1910)	Arkansas
Tulane Univ. of Louisiana School of Medicine	(1928), (1932)	Louisiana
Washington University School of Medicine	(1930)	Missouri
Duke University School of Medicine	(1933)	Texas
Medical College of the State of South Carolina	(1933)	S. Carolina
Vanderbilt University School of Medicine	(1931)	Mississippi

LICENSED BY ENDORSEMENT		
School	Year Grad.	Endorsement of
Yale University School of Medicine	(1933)	N. B. M. Ex.

Ohio Reciprocity and Endorsement Report

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports 16 physicians licensed by reciprocity and 5 physicians licensed by endorsement on April 7, 1936. The following schools were represented:

LICENSED BY RECIPROCITY		
School	Year Grad.	Reciprocity with
Howard University College of Medicine	(1932)	Virginia
University of Louisville School of Medicine	(1935, 2)	Kentucky
Johns Hopkins University School of Medicine	(1934)	Maryland
University of Michigan Medical School	(1931)	Michigan
St. Louis University School of Medicine	(1933), (1934, 2)	Missouri
Creighton University School of Medicine	(1932)	New Jersey
University of Nebraska College of Medicine	(1930)	Nebraska
Duke University School of Medicine	(1934)	Vermont
Hahnemann Medical College and Hospital of Philadelphia	(1921)	Penna.
University of Pennsylvania School of Medicine	(1931)	Penna.
University of Pittsburgh School of Medicine	(1934)	Penna.
Medical College of the State of South Carolina	(1930)	S. Carolina
Medical College of Virginia	(1934)	Virginia

LICENSED BY ENDORSEMENT		
School	Year Grad.	Endorsement of
Rush Medical College	(1934)	N. B. M. Ex.
Tulane University of Louisiana School of Medicine	(1931)	N. B. M. Ex.
Harvard University Medical School	(1930), (1933, 2)	N. B. M. Ex.

Book Notices

California Medical Association Cancer Commission Committee Studies. Paper. Price, 75 cents. Pp. 129. San Francisco, California: California Medical Association, 1936.

The California medical profession has been exceedingly active in the last few years in conducting effective educational campaigns among both the lay public and the profession. In 1931 the house of delegates of the California Medical Association created a cancer commission as one of the prominent commissions of the association. This small volume is the report for 1936. The presentation takes the form of a series of committee reports on various types of neoplasms made by groups of specialists. It is obvious from the technical form in which these papers are written that they are intended primarily for the medical profession. Different committees report on tumors from the various regions or organs, and the Radiological Committee makes some general recommendations as to the use and limitations of radiation therapy. Contradictions that still exist on many of the questions discussed in this interesting and valuable pamphlet are frankly indicated. Owing to the limitation of space the discussion has obviously to be rather dogmatic, but where there are differences of opinion attention is usually called to this fact. For example (on page 59) the Committee on Genito-Urinary Tumors states as regards kidney neoplasms that there is no value in preoperative treatment and recommends postoperative irradiation, but a footnote calls attention to the fact that there is a well marked division of opinion on the subject and that some believe that preoperative treatment only delays surgery. One member is quoted as saying "We have ample evidence of the value of preoperative radiation. . . . It is not unusual to see an operable malignancy entirely done away with so that the operation itself becomes unnecessary." However, the committee adds that "it is hoped that in time sufficient statistical end-result evidence will be available to settle these questions." It is well to acknowledge that there are still many problems in the therapy of cancer which are still not solved and that any dogmatism on the subject is absurd.

This valuable little book should have a very wide circulation among the profession outside California as well as in it, and other state medical organizations might well learn a lesson from what has been done in California.

Le tonus cardio-vasculaire et l'épreuve amphotrope sino-carotidienne. Par D. Danielopolu, professeur de clinique médicale à la Faculté de médecine de Bucarest. D'après les recherches faites en collaboration avec MM. I. Marcou, A. Aslan, G. G. Proca et E. Manesco. Paper. Price, 40 francs. Pp. 212, with 78 illustrations. Paris: Masson & Cie, 1935.

This excellent monograph deals with a clinical study of the effects of pressure on the carotid sinus and of occlusion of the common carotid artery in a large series of normal persons and persons suffering from a variety of functional and organic cardiovascular diseases. After a brief outline of the history of the subject, the author discusses the mechanism of the nervous regulation of the heart and blood vessels, in which field he himself has done some of the best pioneer work. He presents the view that there is both a humoral and a nervous control of the blood vessels and the heart. The nervous control is a dual one. In part it is mediated by afferent impulses from various parts of the body, acting primarily for the local control of the vessels; the stimuli are metabolic products, and the nerve pathway goes through the central nervous system. In part it is mediated by impulses from the carotid sinus and the root of the aorta, "the blood pressure regulators." The author develops this view in some detail and brings into line the hypothalamic and cortical control. The blood pressure regulators, he emphasizes, act both as pressors and as depressors. He discards as unfounded the simplification of the nervous control, which some workers have maintained exists. While the concept presented may not be accepted by all authorities in all its details, it has the distinct advantage of provoking further investigation.

In the next section the author describes in detail the manner of carrying out the tests of the excitability of the carotid sinus and of its tonic action. He has used the electrocardiogram and the Pachon-Vaquez method of recording blood pressure as measures of the effects. This is followed by a section dealing with the responses obtained in various conditions. He points out that the carotid sinus reflex is normally tonically depressor in character. The response to stimulation in normal individuals may be pressor, depressor, diphasic or dissociated (i. e., pressor on some functions and depressor on others). An intense degree of stimulation is required in order to obtain a response. In pathologic conditions, the response obtained depends on the relative tone of the parasympathetic and sympathetic systems and on the presence or absence of myocardial lesions. Stimulation of the carotid sinus brings out latent abnormalities in cardiac function; therein lies its great prognostic and diagnostic value. While some of the facts presented are not in accord with concepts generally held, the method used and the analysis made are extremely valuable because they open up a new line of studying in man the correlative functions of the circulatory system in relation to its nervous regulation.

The section dealing with the author's theory of hypertension is particularly valuable. The author conceives of hypertension as being a specific involvement of the vascular system in which the local pressor mechanisms, presumably operating by way of afferent nerves, are overactive. The carotid sinus reflex in clinical hypertension, he finds, is decreased but, contrary to views previously expressed, is never absent. In fact, when there is organic heart involvement, it is actually hyperactive. He leaves the impression that the blood pressure regulators cannot combat the effects of the disturbance set up by the other nerve mechanism. The monograph must be referred to for other interesting details.

The illustrations present the electrocardiographic and blood pressure tracings on which the interpretations are based, together with several correlative diagrams. There are many case reports with tabulated summaries of data to illustrate the various points.

This monograph is highly recommended for the internist and the "cardiovascular" specialist as an excellent, stimulating summary of the author's views. The reader will be well repaid for the time spent in perusing it despite the fact that many of the views require further investigation for their confirmation.

My Life and Work: The Search for a Missing Glove. By Dr. Adolf Lorenz, Hofrath and Professor of Orthopædic Surgery, University of Vienna. Cloth. Price, $3.50. Pp. 362, with 19 illustrations. New York & London: Charles Scribner's Sons, 1936.

This autobiography is a Horatio Alger type of story of a young Austrian peasant boy whose ambition and determination to become a gentleman were realized by his rise from poverty to fame and fortune. Fate and circumstances prevented him from doing aseptic surgery but he became a manipulator of bones and joints and popularized the art of what he called "bloodless surgery." His success, egotism, and a certain royal arrogance aroused the antagonism of his medical colleagues in Vienna. Obstacles of all kinds were thrown in his pathway but he refused to be discouraged. In his first visit to America he was received with enthusiasm by members of the medical profession and by the social and political leaders of the country. Few men have received the acclaim that was bestowed on him. The personality and superb showmanship of this "dry" surgeon delighted the imagination of the masses and made excellent newspaper copy. His name was in every newspaper and on the lips of most of the American people. Lorenz had become the famous gentleman of his childhood dreams. He had "found the other glove." During the war he dropped out of sight as far as this country was concerned. The large fortune which he had built up, much of which had come from wealthy patients in the United States, was lost. At the close of the war this man who had so loved the spotlight of world acclaim was "alt, krank und arm, dass Gott erbarm" (old, sick and poor, God have mercy). "To be old, sick and poor is the most terrible tragedy to befall a man." The headings of the chapters such as "Imported by America" and "Reconquering America" give a glimpse of his egocentric personality. The story of his trials when he returned to this country after the war to try to regain his wealth and position arouses a feeling of sympathy. He was ignored by the members of the medical profession, and few of his former admirers came to renew their friendship. A chapter entitled "Dimples and Indemnity Suits" relates with honesty and without apparent bitterness how he paid for some of his

errors of judgment or skill. Physicians and surgeons may read this book with mixed feelings of interest and distaste. The procedures which Lorenz called "bloodless surgery" are merely simple manipulations which are of value in a few types of conditions, but they are no longer surrounded by the veil of mystery which led a gullible public to believe them to be miracles. The lay reader may again be dazzled by the personality of Dr. Lorenz, and every one who loves the romance of success will find the book fascinating. Those who condemn the author for his love of the spotlight of public acclaim, his continual playing to the gallery or his mercenary attitude or who may be subconsciously jealous of him because of the financial success and world popularity which he achieved should be honest enough to admit after reading this book that some of the credit for the prominence of and interest in orthopedic surgery as a specialty belongs to Dr. Adolf Lorenz.

Differentialdiagnose in der inneren Medizin. Von Prof. Dr. med. O. Naegeli, Direktor der medizinischen Universitätsklinik, Zürich. Lieferung 1. Paper. Price, 9.60 marks. Pp. 216, with 61 illustrations. Leipzig: Georg Thieme, 1936.

This is a highly condensed summary of the significant points in differential diagnosis. It is printed clearly on excellent paper and the illustrations, many of which are diagrammatic drawings, are ample and well chosen. The color plates, especially those depicting blood smears, are of the usual excellence associated with German printing. The book is the first volume of a three volume work (the second and third volumes to appear during 1936-1937) and includes discussion of the differential diagnosis of the anemias, hemorrhagic diatheses, leukemias, myeloid diseases, mediastinal and lymph node disorders, the common throat infections and diseases of the spleen, liver and gallbladder. It is presumed that the other fields of internal medicine will be considered in the succeeding volumes. Naegeli, a master of medicine, is unusually precise and brief. There is great stress placed on the chemical and morphologic changes of the blood and perhaps somewhat too little emphasis of the whole composite picture of the disease and especially of the important rôle assumed by the "history" of the patient. The trend toward overemphasis of laboratory data is more manifest in Germany than here. The immense value of laboratory diagnostic information is unquestioned and constant advances in technic and method of physiologic study of patients has added greatly to increasing accuracy in diagnosis; but clinical evaluation of such data must consider the patient as a whole and as the very core of diagnosis and treatment. In this work there is the suggestion of considering the patient as a loosely correlated collection of systems rather than as a finely integrated whole. Naegeli's discussion of the differential diagnosis of icterus, however, is particularly well done. The volume can be recommended as a concise and accurate consideration of the diagnostic problem in the field considered.

Anthraco-Silicosis Among Hard Coal Miners. From the Office of Industrial Hygiene and Sanitation, Surg. R. R. Sayers, Medical Officer in Charge. Engineering Studies by J. J. Bloomfield, Sanitary Engineer, and J. M. Dalla Valle, Assistant Sanitary Engineer, Medical Studies by R. R. Jones and Waldemar C. Dreessen. Statistical Analysis by Dean K. Brundage, Statistician, and Rollo H. Britten, Senior Statistician. With Sections on Autopsy Material by J. W. Miller, Acting Assistant Surgeon, and on Silica in the Urine and in Lung Specimens by F. H. Goldman, Associate Chemist, U. S. Public Health Service. Prepared by Direction of the Surgeon General. U. S. Treasury Department, Public Health Service, Public Health Bulletin No. 221, December 1935. Paper. Price, 25 cents. Pp. 114, with 75 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1936.

Under an agreement with the mine operators, the mine workers and the state of Pennsylvania, the Public Health Service selected for detailed study a group of mines in the anthracite district. This bulletin gives a report of the investigation. The study of the dust exposure of the men included the nature of the dust, the size of the dust particles, and the dust concentration in the different parts of the mines. The dust exposure correlated with each occupation resulted in an estimation of the exposure of the men "per week, per month, or per year."

Occupations which were dust producing and lead to severe exposures included 53 per cent of the men. Among men who did the drilling, especially the rock drillers, the silica content of the material rose as high as 43 per cent of quartz. The greatest exposure underground was experienced by the regular miners and rock drillers, while above ground the coal breakers and slate pickers experienced the highest exposure.

The physical condition of the men was determined by a routine examination including the occupational history, past medical history, history of present complaints or illness, and physical and roentgenologic examination. The group studied included 2,711 workers, of whom 361 with little or no dust exposure were considered as "normal." The remainder of the 2,711 men were examined in order to find those suffering from anthracosilicosis. A group of 135 disabled ex-miners were studied as a basis of "control."

In the 616 men found to be suffering from anthracosilicosis, special information was obtained. It was found that this group was subject to more attacks of pleurisy, pneumonia and severe colds than the normals. They complained of more of the cardinal symptoms of the disease than the normal group. The physical manifestations of the disease were more prevalent and more pronounced in this group than among the normals.

Correlation of the physical appearances with the dust exposure disclosed that the incidence of anthracosilicosis was more pronounced in the dry mines than in those using wet drilling. Anthracosilicosis increased with increased dustiness, with higher quartz content of the rock worked, and with longer years in the specific occupation and in the mining industry. A presumptive "threshold dosage" for the different exposures was suggested. When the quartz content was less than 5 per cent, the number of cases of anthracosilicosis was negligible if the dust counts were kept below 50 million particles per cubic foot of air. When the quartz content rose to about 13 per cent, the safe limit appeared to be from 10 to 15 million particles per cubic foot of air. In the case of those men exposed to quartz content as high as 35 per cent, the limit was set at from 5 to 10 million particles per cubic foot of air. These figures do not represent an unattainable level, as there were mines in which control measures had reduced the dust hazard below these figures.

The bulletin contains a section of reproductions of roentgenograms of the disease in different stages, which is a fine collection and a worthy adjunct to the report.

Terapéutica clínica: I. Agentes terapéuticos; II. Técnicas terapéuticas; III. Tratamiento de los síntomas; IV. Tratamiento de las enfermedades. Por el Dr. Alfredo Martinet. Con la colaboración de Desfosses, et al. Tercera edición española, corregida por el Prof. Dr. Lutier y traducida con notas y adiciones por el Dr. Angel Ortega y Diez. Prólogo del Dr. Teofilo Hernando, catedrático de la Facultad de medicina de Madrid. Paper. Pp. 1,515, with 352 illustrations. Madrid: Casa Editorial Bailly-Bailliere, S. A., 1935.

In the third Spanish edition of this voluminous French manual of clinical therapeutics, several supplements have been furnished by Ortega y Diez, the translator, and additional notes written by Lutier to adapt the book to the needs of Spanish practitioners: for instance, a list of spas and isothermic and isobaric zones in Spain, and rules regulating the dispensing of toxic substances in that country. Chapters on bacteriophage, vitamins, high frequency currents, asthma and insulin have been brought down to date. New additions discuss barbiturate poisoning, endocrine extracts, intravenous injections of alcohol in acute pulmonary processes, and pyretotherapy of dementia paralytica. The book is divided into four parts. The first, consisting of 481 pages, deals with therapeutic agents of various kinds: pharmaceutical, physical, dietetic, psychic. The second part describes the customary technical procedures, such as cauterization, application of carbon dioxide snow, venesection, blood transfusion, gastric lavage and spinal puncture. The third part is devoted to symptomatic therapy. The causes of symptoms are arranged in alphabetical order. The author deplores this mode of treatment and realizes the fact that a scientifically minded physician bases his curative efforts on the recognition of etiology, pathogenesis and correct diagnosis of the underlying causes. It is questionable whether an extensive description of symptomatic methods of treatment does not enhance the condemnable practice of treating coughing, bleeding or pain without attempting to arrive at a diagnosis. The last part of the book describes the treatment of common diseases. It is evident that in view of such an arrangement of the work repetitions are unavoidable. The style is rather dry; no rhetorical

efforts have been made. The book contains a wealth of material and compares favorably with similar books in English. Being so voluminous, it may be considered rather as a reference book than a textbook on therapeutics.

Lectures on Diseases of Children. By Robert Hutchison, M.D., LL.D., F.R.C.P., Consulting Physician to the London Hospital. Seventh edition. Cloth. Price, $6.75. Pp. 452, with 106 illustrations. Baltimore: William Wood & Company, 1936.

In this edition the type has been reset and the chapter on chronic constipation in infancy and childhood and the chapter on infantile scurvy and pink disease have been rewritten. This volume of collected lectures is intended not so much as a textbook as a clinical approach to common pediatric conditions which, as the author states, are not usually dealt with in systematic lectures on medicine. The contents of the book are probably more suited to British readers than to students in this country, as the majority of subjects are well stressed in medical curriculums on this side of the Atlantic. It seems strange that neither under the discussion of the vitamins nor in the new chapter on scurvy does the author mention the discovery of the chemical nature of vitamin C. The treatment recommended for congenital syphilis is very conservative. The author favors mercury. He recommends neoarsphenamine with hesitation, and he fails to mention sulfarsphenamine, bismuth or acetarsone. In his discussion on tuberculosis the student could hardly acquire the modern concept of the primary complex and the childhood type of this disease. The chapters on rheumatism and rheumatic carditis are well treated, and the chapters on the nervous diseases are comprehensive and well illustrated. The chapters on blood diseases and splenomegaly might have been brought more nearly down to date during the revision of this edition, had such entities as Cooley's anemia and Niemann-Pick's disease been included. The type is easily readable and the illustrations are excellent.

Insulin: Its Production, Purification and Physiological Action. By Douglas W. Hill, B.Sc., Ph.D., Lecturer in Chemistry, University College, Exeter, and Frederick O. Howitt, M.Sc., Ph.D., F.I.C. Foreword by Professor E. C. Dodds. Cloth. Price, 12s. 6d. Pp. 219, with 6 illustrations. London: Hutchinson & Co., Ltd., 1936.

A vast amount of literature is presented in this book in a systematized, condensed form and is thus made available to the many interested in the field of carbohydrate metabolism who are unable to follow the extensive literature as fully as they may desire. The subject is considered from both the chemical and the physiologic point of view. The historical background to the final isolation of insulin is well presented. The methods of preparation and purification of insulin are then described and finally various evidence bearing on the mode of action of insulin is discussed. The preface relates that the monograph is not intended to be used as a textbook but should be regarded more in the nature of a set of notes and that the authors purposely refrain from drawing what sometimes at least appear to be obvious conclusions. They merely collect and sift the evidence. That this has been a task of magnitude is indicated by the bibliography, which contains more than 1,600 references. Author and subject indexes add to the value of the work as a book of reference.

Second Symposium on Silicosis: An Unofficial Transcript of the Second Silicosis Symposium Held in Connection with the Trudeau School of Tuberculosis at Saranac Lake, N. Y., June 3 to 7, 1935. Edited by B. E. Kuechle, Claims Manager, Employers Mutuals, Wausau, Wis. Paper. Price, $3. Pp. 194. Wausau, Wis., 1935.

It is inevitable that these papers contain some repetition of the 1934 symposium material, as it is unlikely that the general subject of silicosis or even of its specialized divisions changes or develops greatly in the course of one year. The papers are valuable because they give in a rather informal way a review of opinions and facts as of June 1935.

R. R. Sayers presented the etiology of silicosis; D. E. Cummings talked on the estimation of dustiness, the taking of occupational histories, and the administrative control of silicosis. L. U. Gardner presented the pathology of silicosis; W. S. McCann gave the physiology of silicosis and discussed his procedure for estimating disability. A. R. Riddell and H. H. Kessler both talked on the clinical aspects of silicosis. D. M. Brumfiel discussed the survey the Saranac Laboratories is conducting to determine the number of cases in sanatoriums and the results of treating such patients. E. P. Pendergrass and H. L. Sampson both discussed the roentgen diagnosis of silicosis, presenting a large number of illustrations. Philip Drinker discussed the engineering control of silicosis, and the symposium closed with a discussion of silicosis as a social problem, by A. J. Lanza.

A considerable group of physicians and engineers attended both the 1934 and 1935 meetings, many of them coming both years. The meetings were all interesting and the discussions lively, in marked contrast to the conventionally dull affairs one encounters at most technical meetings. The papers are an annual report on silicosis and the meetings a forum at which to debate controversial matters. It is understood that the symposium cannot be held this summer but it is to be hoped that Dr. Gardner will arrange for another meeting in 1937.

The Early Diagnosis of Malignant Disease for the Use of General Practitioners. By Malcolm Donaldson, F.R.C.S., M.B., B.Ch., Physician Accoucheur and Director of Cancer Dept., St. Bartholomew's Hospital, Stanford Cade, F.R.C.S., Surgeon to Out-Patients, Westminster Hospital, William Douglas Harmer, M.A., M.C., F.R.C.S., Consulting Surgeon, Throat Dept., St. Bartholomew's Hospital, R. Ogier Ward, M.Ch., F.R.C.S., Assistant Surgeon, St. Peter's Hospital, and Arthur Tudor Edwards, M.A., M.D., M.Ch., Surgeon, Westminster Hospital. Cloth. Price, $3. Pp. 168. New York & London: Oxford University Press, 1936.

It has been said that the ultimate fate of the cancer patient lies in the hands of the first physician consulted, who in the great majority of cases is a general practitioner. The author in his introduction states that it is with the object of helping general practitioners to suspect, exclude and diagnose malignant or premalignant conditions that he and his colleagues have compiled this small book. There are twelve chapters, eight of which are written by Stanford Cade, one of the leading English authorities on the subject of cancer. The book is well written and covers the subject in a concise but thorough manner. With regard to biopsy Dr. Cade says "In my opinion the danger of biopsy is purely theoretical and entirely unsupported by practice." One of the best chapters in the book is on the early diagnosis of cancer of the breast. In this the author writes "early diagnosis of mammary cancer should be made with the mind's eye first, with the microscope next, and with the hands, eyes and nose last, if ever." This small book is unique and we know of no other that covers this subject. Contrary to the usual custom of textbooks it deals with signs and symptoms that are really early ones, rather than with the classic picture, which is usually one of advanced cancer. This book should be read by every practitioner of medicine and it is recommended as a textbook for senior medical students.

Monographien aus dem Gesamtgebeit der Physiologie der Pflanzen und der Tiere. Herausgegeben von M. Gildemeister, R. Goldschmidt, R. Kuhn, J. Parnas, W. Ruhland und K. Thomas. Band XXXIV: Physiologie des Menschen im Flugzeug. Von Dr. Gustav Schubert, Privatdozent an der Deutschen Universität Prag. Paper. Price, 14.80 marks. Pp. 206, with 27 illustrations. Berlin: Julius Springer, 1935.

This is the most complete treatise on the physiology of flying yet published. Each chapter deals with a separate system of the body wherein the stresses imposed and the tolerances found are fully discussed. A considerable portion of the work is devoted to a determination of the type and magnitude of the stresses developed during various aircraft gyrations, and this constitutes the greatest original contribution of the author. It is obvious from an examination of this book that much research remains to be done both to fill gaps in our knowledge and also to check a considerable amount of the previous work, which appears in many instances to be inaccurate or inconclusive. Each chapter contains several graphs and charts and is followed by a comprehensive bibliography.

The Early Diagnosis of the Acute Abdomen. By Zachary Cope, B.A., M.D., M.S., Surgeon to St. Mary's Hospital, Paddington. Seventh edition. Cloth. Price, $3.75. Pp. 254, with 33 illustrations. New York & London: Oxford University Press, 1935.

This monograph first appeared in 1921. The fact that a seventh edition has become necessary attests its popularity. The facts presented are familiar to every practitioner but seldom used in everyday practice. The author has added some new observations, particularly with regard to the use of the x-rays. The work is of value to all surgeons who have fallen into a slight rut and reminds them of some of the things they learned long ago.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Evidence: Admissibility of Opinion of Expert Witness Based on Roentgenogram Not in Evidence.—The courts of Missouri have hesitated, said the St. Louis court of appeals, to hold that roentgenograms are not themselves the best evidence of what they show; yet there is reason for such a holding. Differing from ordinary photographs, which in most instances can be fully understood and appreciated by the ordinary person who views them, roentgenograms in their very nature must necessarily be interpreted by an expert, else they are of no value to the jury. While a jury is entitled to have offered to it the best evidence of a fact which it is capable of passing on, in the case of roentgenograms, so far as the jury is concerned, the best evidence of what they disclose, at least from a practical standpoint, is the interpretation given them by the experts who examine them and who testify in as plain language as possible as to what their findings have been. In the present case, the deposition of an expert witness was admitted by the trial court setting forth the expert's interpretation of a roentgenogram. At the time the deposition was taken, the witness did not have the roentgenogram before him but based his testimony on a memorandum he had previously made. The admission of this testimony, said the St. Louis court of appeals, did not constitute error, particularly in view of the fact that the witness stated that the roentgenogram was at his office and was made readily accessible for use by the defendant who objected to the admission of the testimony.—*Arnold v. Metropolitan Life Ins. Co. (Mo.), 89 S. W. (2d) 81.*

Malpractice: Fragment of Needle Left in Chest After Thoracentesis.—The defendant, a physician, in treating the plaintiff for pleurisy with effusion, inserted an 18-gage hypodermic needle posteriorly between the seventh and eighth ribs. Owing to a sudden movement of the patient, the end of the needle broke off inside the thoracic cavity. A roentgenogram showed the fragment to be lodged in such a position that its removal was inadvisable, if not impossible. The patient recovered from the pleurisy, but the fragment of the needle caused him considerable pain and some disability. Eventually he sued the defendant. At the close of the plaintiff's evidence the trial court directed a verdict for the physician, and the plaintiff appealed to the Supreme Court of Minnesota.

The plaintiff contended that certain statements allegedly made by the physician immediately following the accident constituted an admission of malpractice; namely, that "he broke the needle," that he "should have used a stronger needle," that he "shouldn't have done it" and would "never try it again," and that the accident "couldn't be helped" because of "the handicap" under which he was working. The contention that the defendant himself admitted lack of the requisite skill to perform the operation, said the Supreme Court, lacks substantiating evidence. There was no evidence that he ever made any such admission expressly, and reasonable implication cannot make over into such an admission any words ascribed to him. It may be assumed, said the court, that the jury could have concluded that the defendant himself believed that, if he had used a stronger needle or had taken greater precautions to prevent the patient's moving during the operation, the needle would not have broken. Regardless, however, of whatever the defendant himself thought of the matter, if in fact he conducted the operation according to the accepted standard of his profession, he cannot be held guilty of malpractice. Even assuming the truth of all the alleged admissions, it does not follow that the defendant was guilty of malpractice. There was, in the opinion of the court, still no evidence from which the jury could have found reasonably that the defendant failed to perform the operation according to an accepted standard of his profession. The test is not whether the physician used his own best skill and ability. No one is always at his best. In the absence of special agreement, one employing a physician has only a right to expect the ordinary skill and ability of his profession. If he lacks that, it is no defense that he did his best. If an individual physician possesses greater than the average skill, he is still not liable for malpractice so long as he uses the degree of skill and care of the average member of his profession. If the rule were otherwise, it would always be necessary to establish the particular physician's endowments of skill and ability, and there could be no fixed standard as to the ability which a patient would have a right to expect.

The Supreme Court concluded that even admitting the truth of the alleged admissions, a prima facie case for the plaintiff was not made out. The judgment refusing the plaintiff a new trial was affirmed.—*Quickstad v. Tavenner (Minn.), 264 N. W. 436.*

Medical Practice Acts: Mandamus to Compel Issuance of License Refused.—The state board of health of Missouri revoked the license of Dr. Lewis C. Schneider to practice medicine, on a charge of dealing illegally in narcotics. The medical practice act provides that any person whose license has been revoked shall have the right to have the proceedings reviewed, on a writ of certiorari, by the circuit court of the county in which the board held its meeting when the license was revoked. Dr. Schneider did not apply for a writ of certiorari, but, about two years after the license was revoked, he petitioned the circuit court for a writ of mandamus to compel the board to issue him a license. The circuit court gave judgment for Dr. Schneider and the board appealed to the Supreme Court of Missouri.

The board contended that Dr. Schneider had an adequate remedy by certiorari to review the board's action in revoking his license and that therefore mandamus would not lie. With this contention, the Supreme Court agreed. Mandamus, said the court, is an extraordinary remedy and will be granted only where there is no other legal remedy. Since the medical practice act expressly provides that the action of the board in revoking a license may be reviewed by certiorari, the writ of mandamus is not available. Accordingly, the Supreme Court reversed the judgment of the circuit court.—*State ex rel. Schneider v. Bourke (Mo.), 89 S. W. (2d) 31.*

Workmen's Compensation Act: Compensability of Medical Disability Due to Silicosis.—The employee, Borkowski, had been exposed to silica dust for eight years. At the time of his discharge, July 31, 1932, he admittedly had silicosis. He later applied to the industrial commission for compensation. An award of compensation was affirmed by the circuit court, Dane County, Wis., and the employer and its insurer appealed to the Supreme Court of Wisconsin.

That the applicant sustained a medical disability during the course of his employment was conceded, but medical disability, said the Supreme Court, does not in the absence of an actual wage loss entitle an employee to compensation. No serious effort was made in the present case to show that the employee had actually sustained a wage loss resulting from his inability to perform his work because of silicosis. In the absence of any showing of wage loss, the employee was not entitled to compensation under the provisions of the workmen's compensation act. The judgment of the circuit court, affirming the award, was therefore reversed.—*Chain Belt Co. v. Industrial Commission (Wis.), 264 N. W. 502.*

Society Proceedings

COMING MEETINGS

Idaho State Medical Association, Boise, Aug. 31-Sept. 4. Dr. Harold W. Stone, 105 North Eighth St., Boise, Secretary.

National Medical Association, Philadelphia, Aug. 16-22. Dr. W. Harry Barnes, 1315 North 15th St., Philadelphia, Acting Secretary.

Northern Minnesota Medical Association, Fergus Falls, Aug. 31-Sept. 1. Dr. Oscar O. Larsen, Detroit Lakes, Secretary.

Washington State Medical Association, Yakima, Aug. 31-Sept. 2. Dr. Vernon W. Spickard, 1303 Fourth Avenue, Seattle, Secretary.

Wyoming State Medical Society, Cody, Aug. 24-25. Dr. Earl Whedon, 50 North Main Street, Sheridan, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1926 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

11: 385-512 (April) 1936

Pulse Wave Velocity and Arterial Elasticity in Arterial Hypertension, Arteriosclerosis, and Related Conditions. Florence W. Haynes, L. B. Ellis and Soma Weiss, Boston.—p. 385.

Relation of Arterial Pulse Pressure to Hemodynamics of Arterial Hypertension. Soma Weiss, Florence W. Haynes and Rose Shore, Boston.—p. 402.

Some Cases of Slow Pulse Associated with Electrocardiographic Changes in Cardiac Patients After Maximal Work on Krogh Ergometer. E. Bierring, K. Larsen and E. Nielsen, Copenhagen, Denmark.—p. 416.

Acrocyanosis: Study of Circulatory Fault. A. H. Elliot, R. D. Evans and C. S. Stone, Santa Barbara, Calif.—p. 431.

*Double Aortic Arch with Total Persistence of Right and Isthmus Stenosis of Left Arch: New Clinical and X-Ray Picture: Report of Six Cases in Adults. A. Arkin, Chicago.—p. 444.

*Velocity of Blood Flow in Therapeutic Hyperpyrexia. I. Kopp, Boston.—p. 475.

Unusual T Wave in an Electrocardiogram. R. H. Halsey, New York.—p. 489.

Electrocardiographic Changes in Trichinosis. E. H. Cushing, Cleveland.—p. 494.

Double Aortic Arch.—Arkin reports six cases of a clinically new aortic anomaly, two with postmortem observations. This consists of a total persistence of the right aortic arch, combined with a persistence of the left aortic arch in the form of the left subclavian artery, an isthmus stenosis and a diverticulum of the aortic arch (left descending dorsal aortic root); that is, a persistence of both aortic arches as in reptiles. The right arch lies behind the esophagus, and the left arch in front of the trachea. The cases presented the following characteristic roentgen observations: 1. A shadow to the right of the sternum ran upward to the head of the right clavicle, with a distinct systolic pulsation. 2. There was slight displacement of the trachea and definite displacement of the esophagus to the left. 3. The normal aortic knob on the left side was absent or there was only a small shadow of the descending arch on the left side; in some cases there were two aortic knobs, one on each side. 4. In the right oblique position the aortic knob was lying behind the trachea and esophagus, both of which were displaced forward and to the left (most characteristic of all was the circular forward displacement of the esophagus by the arch of the aorta). 5. There was a shadow of the diverticulum either in the retro-esophageal knob or of the descending arch on the left side. 6. In the left oblique position a wide shadow of the ascending aorta was seen to the right of the trachea with evidence that the aortic arch ran behind the esophagus to reach the left side. The following clinical signs were found in the six cases: (1) dulness to the right of the sternum, (2) visible systolic pulsation in the second and third right intercostal spaces, (3) palpable, strong pulsation in the right supraclavicular fossa, (4) maximal intensity of the aortic sounds in the region of the head of the right clavicle, (5) slight displacement of the trachea to the left, (6) tracheal tug and (7) delay in the passage of the stomach tube at the level of the third dorsal vertebra, with transmitted pulsation from the arch of the aorta. Attention is called to the presence of aortic anomalies without any cardiac malformations and in many cases without clinical symptoms.

Velocity of Blood Flow in Therapeutic Hyperpyrexia.—Kopp induced therapeutic fever in two patients with dementia paralytica, one apparently free from heart disease, the second with syphilitic aortic regurgitation and cardiac hypertrophy; the arm-to-tongue velocity time was determined by the decholin method. During the second half of the fever treatments of the patient with an apparently normal heart an increase in the basal velocity of flow occurred and was accompanied by an increase in the pulse rate. The basal velocity of blood flow of the patient with syphilitic heart disease tended also to increase as fever therapy was continued but was accompanied by a slowing in the pulse rate. It is suggested that the changes in the basal velocity of blood flow and pulse rates of both patients are due to the beneficial effects of therapeutic fever on the myocardium, the changes in the patient with syphilitic heart disease resembling those characteristic of digitalis therapy. Therapeutic fever caused an increase in the velocity of the blood flow in both patients, but no absolute quantitative relationship was found between the percentage increases in the velocity of flow and the degree of temperature rise. The increases in the velocity of flow were least marked during typhoid vaccine fever. Based on average values for nearly similar rises in body temperature in diathermy fever, the increase in the velocity of the blood flow of the patient with syphilitic heart disease was much greater than that of the patient with an apparently normal heart. The response of the cardiovascular system to induced fever is proposed as a new test of cardiac function and reserve.

American J. Obstetrics and Gynecology, St. Louis

31: 731-910 (May) 1936

Blood Chemistry and Renal Function in Abruptio Placentae. W. J. Dieckmann, Chicago.—p. 734.

Late Results in Treatment of Leukoplakic Vulvitis and Cancer of Vulva. F. J. Taussig, St. Louis.—p. 746.

Etiology, Diagnosis and Treatment of Evisceration Following Laparotomy. E. von Graff, Des Moines, Iowa.—p. 754.

*Hormone Studies with Ovipositor Lengthening Reaction of Japanese Bitterling. A. E. Kanter, C. P. Bauer and A. H. Klawans, Chicago.—p. 764.

Mechanics of Uterine Support and Position: I. Factors Influencing Uterine Support (Experimental Study). W. F. Mengert, Iowa City.—p. 775.

Syndrome Suggestive of Estrogenic Deficiency: Clinical Study. P. F. Schneider, Evanston, Ill.—p. 782.

Effects of X-Ray and Radium on Cancer of Cervix. E. S. Auer, Denver.—p. 790.

Technic of Successful Removal of the Septum of Uterus Septus and Subsequent Deliveries at Term. R. Luikart, Omaha.—p. 797.

Premature Separation of Placenta and Circulatory Collapse Associated with Pericardial Effusion. H. E. Harvey, Lincoln, Neb.—p. 803.

*Action of Ovarian Follicular Hormone in Menopause, as Indicated by Vaginal Smears. G. N. Papanicolaou and E. Shorr, New York.—p. 806.

The Mild Toxemias of Late Pregnancy: Their Relation to Cardiovascular and Renal Disease. W. W. Herrick and A. J. B. Tillman, with collaboration of Lucile Grebenc, New York.—p. 832.

Is Superfetation Possible in the Human Being? W. E. Studdiford, New York.—p. 845.

Toxemias of Pregnancy: IV. Carbohydrate Metabolism. A. W. Rowe, Mary A. McManus and A. J. Plummer, Boston.—p. 856.

Behavioral Consequences of Cerebral Birth Lesions. E. A. Doll, Vineland, N. J.—p. 866.

Neonatal Mortality: Review of Four Hundred and Twenty-Eight Deaths. C. T. O'Connor, Boston.—p. 872.

Surgical Complications in Pregnancy. F. O. Priest, Chicago.—p. 878.

Influence of Medical Diseases on Obstetric and Fetal Mortality. E. Allen and C. P. Bauer, Chicago.—p. 885.

Postoperative Embolus: Unusual Case. J. J. Madden, Brooklyn.—p. 891.

Clinical Study of Effect of Camphor-in-Oil on Lactation. M. D. Klein, New York.—p. 894.

Hormone Studies with Ovipositor Lengthening Reaction of Japanese Bitterling.—In their interpretation of some 1,000 tests, Kanter and his associates observed that the bitterling should be standardized if consistent results with the minimum of error are desired. In testing with commercial hormone products they found that estrogenic preparations gave uniformly positive results, the amount of hormone in rat units necessary to produce a positive test varying with the various products. The authors feel that, in conjunction with one of the other biologic tests, the test on the bitterling will prove of value as an aid in diagnosis when ectopic pregnancy, incomplete abortion, missed abortion, placental polyp or any other condition in which the death of the fetus is suspected. Only when one is familiar with all the facts in any clinical problem can the test be applied as a diagnostic aid in pregnancy conditions. The authors' work shows that only those preparations containing estrogenic substance can influence ovipositor lengthening. Pregnancy urine, urine from nonpregnant women at certain stages in the menstrual cycle, urine from sexually

active males, urine from women with cystic mastitis and extracts of some tumors give positive tests. The activating hormone is heat stable and apparently ether soluble.

Action of Estrogenic Substance in Menopause.—Papanicolaou and Shorr describe the changes that take place in the vaginal secretion during the administration of estrogenic substance in two cases. With adequate amounts of the preparation there occurred a transformation of the vaginal smear from the menopausal to a type with large flat cells, largely cornified, with small pyknotic nuclei. This is the type of smear which is found normally during the follicular phase of the menstrual cycle just prior to ovulation. This change in the smear was generally associated with relief of the menopausal symptoms. With cessation of treatment or diminution of dosage, the smears gradually regressed and symptoms reappeared. A short period of bleeding usually followed, which is regarded as analogous to postovulatory bleeding. Biopsies of the vaginal wall at various stages during treatment showed a close correlation between the changes in the vaginal epithelium and in the vaginal fluid. As a result of treatment, the vaginal epithelium became hypertrophic with the more superficial cells showing cornification and small pyknotic nuclei. The outer basal zone was better differentiated and showed nuclear enlargement and mitoses. The daily dose required to induce complete changes in the smear and disappearance of symptoms varied from 250 to 3,000 rat units. Oral administration required a minimum of fifteen to twenty times the hypodermic dose. The vaginal smear test furnishes a simple objective guide for the treatment of the menopausal syndrome with estrogenic substance.

American Journal of Physiology, Baltimore

115: 497-730 (May 1) 1936. Partial Index

Studies on Secretion of Oral and Pharyngeal Mucus. Mary F. Montgomery and J. S. Stuart, San Francisco.—p. 497.

Respiratory Center. V. E. Henderson and E. H. Craigie, Toronto.—p. 520.

Gas Equilibriums in Lungs at High Altitudes. D. B. Dill, E. H. Christensen and H. T. Edwards, Boston and Copenhagen, Denmark.—p. 530.

Excretion of Skiodan, Diodrast and Hippuran by Dog. K. A. Elsom, P. A. Bott and E. H. Shiels, Philadelphia.—p. 548.

Skeletal Changes in Rat Induced by Ration Extremely Poor in Inorganic Salts. Miriam F. Clarke, A. L. Bassin and A. H. Smith, New Haven, Conn.—p. 556.

Action of Nitrogenous Bases of Gastric Juice on Blood Pressure, Pancreatic Secretion and Flow of Bile. S. A. Komarov, Montreal.—p. 604.

Relation of Adrenal Cortex to Reproduction and Lactation. S. W. Britton and R. F. Kline, Charlottesville, Va.—p. 627.

Velocity of Blood Flow in Arteries in Animals. T. E. Machella, Philadelphia.—p. 632.

Control Basal Diets in Anemic Dogs: Method Factors and Hemoglobin Production. G. H. Whipple and F. S. Robscheit-Robbins, Rochester, N. Y.—p. 651.

Insensible Water Loss in Relation to Water Ingestion in Man. J. F. Hall Jr. and G. S. McClure, Rochester, N. Y.—p. 670.

Effect of Oxygen Lack, Variations in Carbon Dioxide Content of Inspired Air, and Hyperpnea on Visual Intensity Discrimination. E. Gellhorn, Chicago.—p. 679.

Periodic Micturition in Cat After Section of Sacral Nerves. O. R. Langworthy and F. H. Hesser, Baltimore.—p. 685.

Experimental Study of Micturition Released from Cerebral Control. O. R. Langworthy and F. H. Hesser, Baltimore.—p. 694.

Influence of Irradiation Ergosterol and Parathyroid Extract on Rate of Disappearance of Intravenously Injected Calcium Chloride. S. Freeman, Chicago.—p. 701.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

20: 231-346 (May) 1936

A Hilltop on the Syphilologic Marne: Sinews of War and Some Salients of the Front. J. H. Stokes, Philadelphia.—p. 231.

Direct Cost of Syphilis in Representative American City. W. C. Thompson, Baltimore; W. A. Brumfield, Albany, N. Y., and Lucille Caldwell, Baltimore.—p. 243.

Extragenital Chancres: Clinical Study. N. Tobias, St. Louis.—p. 266.

Intravenous Use of Acetarsone in Congenital Syphilis. T. B. Givan and G. Villa, Brooklyn.—p. 275.

*General Paresis: Treatment by Tryparsamide—Induced Fever Sequence. H. C. Solomon and S. H. Epstein, Boston.—p. 281.

Treatment of Dementia Paralytica with Tryparsamide and Induced Fever.—Solomon and Epstein treated nineteen cases of dementia paralytica and two cases of congenital neurosyphilis with tryparsamide and subsequent fever therapy. These twenty-one patients were chosen for fever treatment from a series of eighty-one cases treated with tryparsamide because their response was not satisfactory. The results obtained after fever were good, both clinically and serologically, in every case. In almost every instance the cerebrospinal fluid became negative, and in the majority of cases the spinal fluid response following malaria was much quicker than is to be expected in cases treated from the outset with fever. The authors conclude that a considerable number of preliminary injections of tryparsamide greatly enhance the probabilities of therapeutic success in the treatment of dementia paralytica with fever, and the improvement of the spinal fluid observations occurs more rapidly following fever if the patient has first been prepared by treatment with tryparsamide.

Anatomical Record, Philadelphia

65: 1-130 (April 25) 1936

Glomerular Basement Membrane of Hypertension in Experimentally Produced Hyperpituitarism. R. F. Blount, Minneapolis.—p. 1.

Monstrosities Produced by Injection of Selenium Salts Into Hens' Eggs. K. W. Franke, A. L. Moxon, W. E. Poley and W. C. Tully.—p. 15.

Spleen Studies: I. Microscopic Observations of the Circulatory System of Living Unstimulated Mammalian Spleens. M. H. Knisely, Chicago.—p. 23.

Some Notes on the Coloration of Baboon Skin. J. Forbes, New York.—p. 51.

An Anomalous Arteria Bronchialis Dextra from the Arteria Subclavia Dextra, Secondarily Connected to the Aorta Thoracalis. J. F. Menke, Baltimore.—p. 55.

Thermal Effect on Rate and Duration of Embryonic Heart Beat of Gallus Domesticus. A. L. Romanoff and M. Sochen, Ithaca, N. Y.—p. 59.

Comparative Study of Thyroid Glands of Hypophysectomized Newts After Treatment with Anterior Pituitary, Thyroid and Iodine. A. Elizabeth Adams and Beatrice Gray, South Hadley, Mass.—p. 69.

Inherited Polymastia in Chimpanzee: Report of Case. J. H. Elder, New Haven, Conn.—p. 83.

*New Method for Staining Nerve Fibers and Nerve Endings in Mounted Paraffin Sections. D. Bodian, Chicago.—p. 89.

The Structure of Capillaries and Unmyogenic Character of Rouget Cells (Pericytes) in the Omentum of Rabbits and in the Web of Living Frogs. N. A. Michels, Philadelphia.—p. 99.

Method for Staining Nerve Fibers.—Bodian found that paraffin sections could be impregnated with strong protein silver and the silver reduced with hydroquinone, to give selective and sharp staining of nervous elements, only provided that a small amount of metallic copper or mercury was added to the silver bath. This method has been found invariably successful in demonstrating, in properly fixed material, myelinated fibers and the finest unmyelinated fibers of central and peripheral nervous systems, the end feet of Held, neurofibrillae and other nervous elements. It can be used successfully on brain, spinal cord, peripheral nerve, old formaldehyde-fixed human material and sections stained previously with toluidine blue. Briefly the method is as follows: 1. For serial paraffin sections of whole brains, fixation by perfusion with 80 per cent alcohol is most satisfactory. 2. The paraffin may be removed with xylene and sections run through absolute alcohol and 95 per cent alcohol to distilled water. 3. The sections may be placed in a solution of 1 per cent strong protein silver containing from 4 to 6 Gm. of metallic copper per hundred cubic centimeters of solution, for from twelve to forty-eight hours at 37 C., and are washed in distilled water. The silver can be used only once. 4. The section is placed in a reducing solution of 1 Gm. of hydroquinone, 5 Gm. of sodium sulfite and 100 cc. of distilled water for ten minutes and then washed thoroughly in distilled water. 5. Gold is toned in by placing the section for five minutes in a solution of 1 per cent gold chloride, containing 3 drops of glacial acetic acid per hundred cubic centimeters of solution, and washing it in distilled water. If sections do not have a light purple color, they are placed in a 2 per cent solution of oxalic acid until the entire section has a definite purplish tinge and then washed in distilled water. The residual silver salts are removed with a solution of 5 per cent sodium thiosulfate in from five to ten minutes. 6. The sections are washed thoroughly in distilled water, dehydrated and mounted in balsam. The author used the method to stain, simultaneously by means of a rack, about 600 paraffin sections of the opossum brain, with uniformly brilliant impregnation throughout and no objectionable precipitate on either sections or slides.

Annals of Surgery, Philadelphia

103: 641-862 (May) 1936

The Master Surgeon and the Layman. R. L. Payne, Norfolk, Va.—p. 641.
Brain Abscess. J. E. J. King, New York.—p. 647.
*Surgical Treatment of Epileptiform Seizures. L. Davis and W. Droegemueller, Chicago.—p. 669.
Carcinoma of the Breast: Study of the Five Year End Results. W. P. Nicolson, Atlanta, Ga., and M. D. Berman, Jackson, Miss.—p. 683.
Ultimate Phase of Life as It Relates to Wounds of the Heart. W. O. Bullock, Lexington, Ky.—p. 696.
Suppurative Pericarditis: Late Results and Methods of Drainage. A. M. Shipley, Baltimore.—p. 698.
Development of Selective Extrapleural Thoracoplasty for Pulmonary Tuberculosis. F. S. Johns, Richmond, Va.—p. 706.
Technic of Thoracoplasty for Pulmonary Tuberculosis. B. N. Carter, Cincinnati.—p. 711.
Surgical Treatment of Congenital Tracheo-Esophageal Fistula in the New-Born. M. Gage and A. Ochsner, New Orleans.—p. 725.
*Ulcer of Pyloric Sphincter. J. S. Horsley, Richmond, Va.—p. 738.
Meckel's Diverticulum with Peptic Ulcer. D. B. Cobb, Goldsboro, N. C.—p. 747.
Obstruction of Small Intestine Due to Food Products. F. W. Griffith, Asheville, N. C.—p. 769.
*Shoulder and Clavicular Pain in Appendicitis. E. V. Mastin, St. Louis.—p. 773.
Serious Complications Following Neglected Cholelithiasis. F. W. Bailey, St. Louis.—p. 781.
Treatment of Amebic Abscess of Liver. H. A. Royster, H. B. Haywood and W. W. Stanfield, Raleigh, N. C.—p. 794.
Abdominal Gas Bacillus Catastrophes. R. L. Rhodes, Augusta, Ga.—p. 804.
Inguinal Hernia. R. A. Woolsey, St. Louis.—p. 812.
Surgical Treatment of Giant Cell Tumor. B. L. Coley and N. L. Higinbotham, New York.—p. 821.
Some of the Hazards of Irradiation. J. S. Davis, Baltimore.—p. 836.
Tumors of Kidney. G. R. Livermore, Memphis, Tenn.—p. 846.
Atraumatic Removal of Needle from Hand Under Fluoroscopic Control. W. H. Prioleau, Charleston, S. C.—p. 854.

Surgical Treatment of Epileptiform Seizures.—Davis and Droegemueller studied all their patients having intracranial tumors in an effort to determine whether the attacks were more frequent after operation, remained the same, were less frequent or did not recur. Of the patients with glioblastomas, 10 per cent of those having attacks prior to operation had none after operation up until the time of death, and 32 per cent had fewer and less severe attacks following operation. Of the astrocytoma group, 31 per cent were judged to be unimproved as far as their convulsions were concerned; 50 per cent had fewer and less severe attacks, and two (6 per cent) had no attacks following operation over an interval of three and six years, respectively. These figures approximately represent the condition that exists in the other tumors in the glioma group. Of the meningioma group three patients were definitely worse following operation and finally had to be placed on bromide or phenobarbital therapy. Eight patients had fever attacks which were less severe, but were not entirely free, in spite of the fact that their tumors had been removed completely. The remaining five patients who had convulsions before operation had no further convulsions following removal of their tumor and have been without bromide or phenobarbital therapy. It becomes apparent that, although these tumors have been removed completely, certain changes must have been produced within the brain which continue to act as irritative foci releasing a convulsive discharge. These changes may be and probably are microscopic in nature, and further surgical procedures under such circumstances are illogical and contraindicated. Particularly is this true when these attacks can be so well controlled by judicious medicinal therapy. In general, the removal of an intracranial tumor is followed in the majority of patients by definite improvement in the frequency and severity of the convulsive seizures. It cannot be guaranteed, however, that the attacks will completely disappear. It is now the authors' custom to begin bromide or phenobarbital therapy preoperatively on those patients who give a history of convulsive attacks and to continue that therapy after operation. By maintaining a constant bromine level in the blood, the patient's attacks can be stopped and the dosage of bromides reduced gradually.

Ulcer of Pyloric Sphincter.—In eleven years Horsley operated on twelve patients with peptic ulcer either solely (nine) or partly within the pyloric ring. A partial gastrectomy, a modification of the first method of Billroth, was done. That partial gastrectomy is the proper treatment for this type of ulcer seems to be supported by a consideration of the clinical and pathologic features of the lesion. A true ulcer of the pyloric sphincter always has a background of pyloric (gastric) mucosa, because this mucosa normally lines the pyloric sphincter. An ulcer of the pyloric ring, then, is a gastric ulcer the symptoms of which are usually accentuated. The average age of these patients was 46.6 years. Two of them were women and ten were men. The average duration of symptoms was ten and three-fourths years, the duration of the symptoms varying from three months to twenty years. Several of the patients gave a long standing history of indigestion, but the severe symptoms were of only recent date. There was severe pain in nine cases, mild pain in one case, and two patients complained of no actual pain. In the latter two cases there was vomiting of much blood, and there was some bleeding in one other case. In nine cases there was a history of vomiting. A gastric analysis was done in ten of these cases. The average value for free hydrochloric acid was 32.9 units. The highest average value of free hydrochloric acid in any one case was 75. In two cases there was no free hydrochloric acid. In ten cases a roentgenologic examination was made, and in three obstruction was present after twenty-four hours.

Shoulder and Clavicular Pain in Appendicitis.—In 1923, Mastin's attention was called to a case of appendicitis in which pain was referred to the region of the shoulder and clavicle. The second case was seen eleven years later. Recently he sent out 485 questionnaires relative to this subject. In the 351 answers received, three instances were reported. A complete review of American and foreign literature from 1920 to 1935 revealed six additional cases, bringing the total to eleven. Relief of the pain in the upper chest and shoulder region in his two cases following appendectomy indicates that the pain was caused by inflammation of the appendix; consequently it was referred pain. Since the area to which the pain was referred is supplied by the third, fourth and fifth cervical nerves, the afferent impulses arising at the site of the inflammation must have entered the spinal cord in the corresponding cervical segments. The only nerve connected with this segment of the spinal cord, which includes afferent fibers that reach the abdomen, is the phrenic. Consequently these must be regarded as cases in which the pain was referred by way of the phrenic nerve. A possible explanation of this symptom complex is offered by an anatomic diagram showing a communication between the phrenic nerve and the terminal branches of the superior mesenteric plexus. Distribution of phrenic fibers to the appendix must be regarded as anomalous, otherwise this symptom complex would occur more frequently.

Archives of Neurology and Psychiatry, Chicago

35: 937-1174 (May) 1936

Polyneuritis: Clinical and Pathologic Study of a Special Group of Cases Frequently Referred to as Instances of Neuronitis. S. F. Gilpin, F. P. Moersch and J. W. Kernohan, Rochester, Minn.—p. 937.
*Sympathetic Nervous System in Migraine: Negative Effect of Ergotamine Tartrate on Electrical Resistance of Skin During Relief of Migraine Headache. P. Solomon, Boston.—p. 964.
*Calvarial Hyperostosis and the Accompanying Symptom Complex. S. Moore, St. Louis.—p. 975.
*Neuropsychiatric Syndromes Associated with Hyperostosis Frontalis Interna: Preliminary Report. A. D. Carr, St. Louis.—p. 982.
Encephalography: Review of Eight Hundred Encephalograms, with Especial Reference to Subdural Air. F. Lemere and C. H. Barnacle, Denver.—p. 990.
Response of Cerebral Blood Vessels to Electric Stimulation of Thalamus and Hypothalamic Regions. G. W. Stavraky, Montreal.—p. 1002.
Experience of Body-Self in Schizophrenia. A. Angyal, Worcester, Mass.—p. 1029.
*Experimental Studies on Headache: Observations on Headache Produced by Histamine. D. Clark, Heloise Hough and H. G. Wolff, New York.—p. 1054.

The Sympathetic Nervous System in Migraine.—Solomon discusses the need for an accurate means of continuously measuring the activity of the sympathetic nervous system in the study of migraine. The method of utilizing the electrical resistance of the skin is presented for the purpose. In seven patients with migraine the electrical resistance of the skin was measured continuously during the period of relief from a characteristic headache obtained by the use of ergotamine. There was no significant change in any instance, indicating

that the relief from the headache was not accompanied by a change in the activity of the sympathetic nervous system as a whole. In one case a similar lack of change was observed during the spontaneous disappearance and reappearance of the headache. In another, a "march" of neurologic symptoms during a typical headache was likewise unaccompanied by any change in the electrical resistance of the skin. In four control patients without headache, ergotamine caused no change in the electrical resistance of the skin.

Calvarial Hyperostosis and the Accompanying Symptom Complex.—Moore states that reexamination of the roentgenograms of 6,650 human skulls disclosed four types of thickening of the calvaria: internal frontal hyperostosis, frontal nebula, diffuse calvarial hyperostosis and frontoparietal hyperostosis. The type of thickening which is most characteristic and which led to the study involves the frontal bone, which has on its inner table deposits of new bone with occasional extensions to other bones in the base of the skull. This overgrowth or deposit of cancellous bone lies on the inner table and is covered on its intracranial aspect by a smooth lamella of compact bone. This deposit of bone is increased in density, as seen in roentgenograms. Increase of density progresses from the inner table outwardly through the diploe. The hyperostotic deposit is progressive, and roentgenographically it can be divided into degrees of development. Morphologically, it may be either nodular or sessile. In all the hyperostoses there is bilateral symmetry, both in extent and in degree, of the osseous changes. There is no change in the outer table of the skull, which remains regular and smooth. The skull does not increase in size, so that the increased volume of the bone has to be accommodated at the expense of the capacity of the cranial cavity. The incidence of all types was 3.5 per cent. The fact that the hyperostoses coexist in the same persons and that the skulls are generally thickened in cases of all types sustains the view that, though morphologically distinct, all types have the same fundamental etiology. The symptoms described in the case histories are a combination, more or less constant, of headache (often disabling and in patients with internal frontal hyperostosis frequently referred to the forehead with occasional tenderness and a feeling of pressure), obesity, muscular weakness, easy fatigue, "nervousness," depression, dimness of vision and occasional diplopia, epileptiform seizures, mental slowness, dizziness, and disturbance of equilibrium and gait. The symptom complex and the roentgen evidence are so characteristic that, when the one is observed, the appearance of the other may be foretold in a substantial proportion of the cases. Probably the symptoms antedate the osseous changes. The differential diagnosis of the disorder has to be made first from osseous dystrophies. The unequal incidence in the two sexes (98 per cent in women) separates these conditions from other osseous dystrophies, practically all of which occur with approximately the same frequency in the two sexes. The condition is one of rather late adult life. The evidence is that the condition is a metabolic disease in which, as far as is known at present, only fat and calcium metabolism is at fault. The patients sooner or later come under the observation of the neurologist or neurologic surgeon. Unquestionably the psychic manifestations, if progressive, terminate in dementia. In cases of internal frontal hyperostosis it appears that much good might be accomplished by turning down a frontal bone flap. Failure of vision might be helped by decompression of the optic nerves. It is useless to administer antisyphilitic treatment in the belief that the disorder is cerebrospinal syphilis. The administration of thyroid on the theory that thyroid insufficiency is a part of the disease seems out of place in these cases unless hypothyroidism is a known complication of the disorder.

Neuropsychiatric Syndromes Associated with Frontal Internal Hyperostosis.—Carr has observed seventeen cases of hyperostosis of the internal tables of the frontal bones. The observations concur with Moore's opinion that there is a symptom complex or syndrome associated with these changes in the bones of the skull. The importance of the recognition of hyperostosis of the frontal bones of the skull lies in the fact that it assists in more accurately classifying cases of this condition, in many of which the changes in the frontal bones have masqueraded as tumor of the brain or as reactions associated with chronic invalidism. The changes in the frontal bones of the skull could not possibly account for the composite picture or the pictures presented by individual patients. These changes must be considered purely roentgenologic evidence of an entity that is probably metabolic in origin. Menstrual disturbances of various kinds occurred in thirteen of the seventeen patients. There has been some fluctuation in symptomatology, but headache, weakness, dizziness and defective memory were consistent complaints. The psychiatric changes varied widely but were predominantly a confusional state of greater or less duration with marked irritability and memory defects. An attempt has been made to treat a group of these patients with aminoacetic acid by feeding large quantities of gelatin daily. Aminoacetic acid therapy was originally used in an attempt to relieve the marked weakness complained of by one of the patients. The change in the entire picture was so striking that its use has been continued. Several patients have been studied from the point of view of creatine-creatinine metabolism. These patients showed creatinuria, which disappeared under therapy with aminoacetic acid.

Experimental Studies on Headache.—Clark and his collaborators suggest that the headache following the injection of histamine is the result of a discrepancy between the behavior of the blood vessels inside the head as compared with those elsewhere. The rise of the systemic blood pressure after its fall indicates that at least a portion of the total vascular bed is constricting. However, the cerebral vessels remain dilated for a short time, and the cerebral blood flow is increased. In fact, with the rise in systemic blood pressure the cerebral arteries are still further dilated and bear the brunt of heightened intramural pressure with each cardiac systole. Moreover, the ability of the now hypotonic walls of the vessels to absorb pressure changes is much reduced and the pressure variations within the vessels are thus more directly transmitted to sensory end-organs in and about their walls and to the subarachnoid space. It is suggested that the combination of these two factors causes headache through the stretching effects on the walls and perivascular tissues of the larger dural and pial vessels, chiefly the arteries. The walls of these vessels are the sites of origin of the afferent impulses interpreted as pain.

Archives of Ophthalmology, Chicago

15: 803-974 (May) 1936

Degeneration of Cornea, Calcareous (?) and Fatty. R. E. Wright, Madras, India.—p. 803.
Roentgenographic Diagnosis of Retinoblastoma. R. L. Pfeiffer, New York.—p. 811.
Free Cyst Floating in Anterior Chamber: Report of Case. W. H. Evans, Youngstown, Ohio.—p. 822.
*Neoarsphenamine in Treatment of Nonsyphilitic Inflammations of Uveal Tract. H. Lucic, Cheyenne, Wyo.—p. 826.
Kinetic Test for Stereoscopic Vision. F. H. Verhoeff, Boston.—p. 833.
Hypertensive Fundus Oculi After Resection of Splanchnic Sympathetic Nerves: Preliminary Report. F. B. Fralick and M. M. Peet, Ann Arbor, Mich.—p. 840.
Histology of Extra-Ocular Muscles. S. R. Irvine, Boston.—p. 847.
The Problem of Crystalline Lens. B. L. Gordon, Atlantic City, N. J. —p. 859.
Ocular Dominance: Its Independence of Retinal Events. Z. J. Schoen and S. R. Wallace Jr., University, Va.—p. 890.

Neoarsphenamine in Treatment of Nonsyphilitic Inflammations of Uveal Tract.—Having obtained gratifying results in an apparently hopeless case of sympathetic ophthalmia with the use of neoarsphenamine, Lucic considered it worth while to try this drug in the treatment of other types of nonsyphilitic uveitis. He found neoarsphenamine of definite value in the treatment of acute and chronic iridocyclitis of doubtful etiology and of that due to focal infection. Neoarsphenamine is administered by the intravenous route, and the individual dosage is that recommended by syphilologists for the patient with syphilis. It is rarely necessary to give more than four injections in the treatment of acute iritis. In the treatment of chronic uveitis and of sympathetic ophthalmia it is essential to administer several intermittent injections. In each case one is guided by the reaction caused and the clinical results obtained. It is well to remember that in a majority of the cases the drug is being administered in the presence of a focus of infection and that complications may arise. Whenever possible, the administration of arsphenamines should be undertaken only by one versed in this specialty.

Bulletin of Neurol. Inst. of New York, New York

4: 535-728 (April) 1936

The Sense of Smell: XII. Localization of Tumors of Frontal Lobe of the Brain by Quantitative Olfactory Tests. C. A. Elsberg, New York.—p. 535.

Id.: XIII. Summation of Olfactory Impulses from Two Olfactory Membranes and Its Physiologic Significance. C. A. Elsberg, New York.—p. 544.

Some Observations Concerning Relation of Handedness to Language Mechanism. E. C. Chesher, New York.—p. 556.

Quantitative Measures in Studying Development of Behavior Patterns (Erect Locomotion). Myrtle B. McGraw and A. P. Weinbach, New York.—p. 563.

*Remarks on Effects of Roentgen Therapy on Gliomas. E. M. Deery, New York.—p. 572.

The Metabolism of Brain Tissue: V. Vitamins and Enzymes in Brain Tissue. S. B. Wortis, New York.—p. 588.

Concerning Immunologic Specificity of Glioblastoma Multiforme. J. H. Siris, New York.—p. 597.

Pneumencephalographic Diagnosis of Tumors of Corpus Callosum. C. G. Dyke and L. M. Davidoff, New York.—p. 602.

Effects of High Fat Diet, of Inanition, of Injection of Acetone Alone or with Fluids of Varying Osmotic Pressure on Experimental Convulsions in Cats. Sarah R. Riedman, New York.—p. 624.

*Changes in Blood Esterase Associated with Changes in Activity in Multiple Sclerosis. R. M. Brickner, T. Watters, D. Wexler and S. E. Soltz, New York.—p. 656.

A Critique of Therapy in Multiple Sclerosis. R. M. Brickner, New York.—p. 665.

Changes in Physical Signs and Symptoms in Cerebellopontile Angle Tumors Following Lumbar Puncture and Removal of Fluid. L. M. Helfer, New York.—p. 699.

Notes and Impressions from Recent Literature on Fever Therapy: Preliminary Study. Gladys C. Terry, New York.—p. 707.

Effects of Roentgen Therapy on Gliomas. — Deery studied a group of fifty gliomas to determine the effect of irradiation. Only cases were chosen in which both preradiation and postradiation specimens of the tumors were available. The preradiation specimen was obtained when the tumor was first attacked surgically and the postradiation specimen from a second operation or at necropsy. The types comprising the bulk of the series were medulloblastomas, glioblastomas and astrocytomas. Some of the tumors of each type showed striking histopathologic changes which it seemed reasonable to credit to the radiation received. The histopathologic changes considered to be due to irradiation seemed primarily to affect the tumor cells themselves. Manifestations of cell injury were found often which, when severe, resulted in death of the cell. There was an increase of necrosis and often an appreciable reduction in cellularity of the growth as determined by actual cell counts. Mitotic figures in general were less frequent following irradiation. Postirradiation specimens sometimes showed the appearance of or increase in giant cell forms. It is the author's impression that the blood vessel and connective tissue phenomena commonly seen in postirradiation material are secondary and essentially incidental changes. Histopathologic changes, apparently caused by roentgen therapy, were encountered not only in tumors of a lower order of differentiation, such as the medulloblastoma, but also in tumors of a high degree of maturity, such as astrocytomas. Exact information on the reactions of gliomas to irradiation must await the acceptance and adoption of clearly defined standardizations of certain factors which directly affect the statistics of the problem. Chief among such factors are a more exact description of the location and size of the tumor, more exact statements as to the operative procedure carried out on the tumor itself, standardization of the pathologist's evaluations of the degree of malignancy of a given tumor, and finally a general acceptance of what constitutes adequate radiation dosage as well as comparable roentgen therapy technic.

Changes in Blood Esterase in Multiple Sclerosis.— Brickner and his associates examined serum esterase of eighty-nine cases of multiple sclerosis and 617 controls (100 medical students and 517 patients suffering from conditions other than multiple sclerosis). Until now it has been necessary to refer to the blood factors investigated as "lipolytic agents" or even "lipolytic conditions"; it has not been definitely shown whether they were of enzymic character or not. The lipolytic factor of the present investigation satisfies the thermolability requirements for enzymes. The tests have been made by measuring the degree to which serum can cause the breakdown of an ester (methyl butyrate) into fatty acids. For these reasons the active agent in the blood is referred to as an esterase. The esterase values are not distinctive for multiple sclerosis as such, but in the scale of values determined for a large number of cases of all kinds it was found that, during the active stage of multiple sclerosis, the spontaneous values are low and, in the inactive, high. Probably, although final statement cannot be made at present, the values are highest at the beginning of inactivity.

Canadian Medical Association Journal, Montreal

34: 487-608 (May) 1936

Clinical and Other Observations on Canadian Eskimos in the Eastern Arctic. I. M. Rabinowitch, Montreal.—p. 487.

*Primary Aplastic Anemia: Case with Apparent Recovery. E. B. Astwood, Montreal.—p. 501.

*"Tulip Fingers": Ragweed Dermatitis. A. H. W. Caulfeild, Toronto.—p. 506.

Solitary Myeloma of the Ilium. C. Liebman and S. E. Goldman, Montreal.—p. 511.

Schizoid Trends in Children. C. A. Cleland, Brockville, Ont.—p. 514.

The Problem of Maternal Mortality. K. M. Wilson, Rochester, N. Y.—p. 518.

Maternal Deaths. R. E. Wodehouse, Ottawa, Ont.—p. 525.

Calcium and Protein Studies in Malignant Disease. R. O. Bowman, H. C. Pitts, P. H. Mitchell and Elsie Ewertz, Providence, R. I.—p. 527.

Blood Lipids in Polycythemia Vera. E. M. Boyd, Kingston, Ont.—p. 532.

Mortality in Surgery of the Gallbladder. W. O. Stevenson, Hamilton, Ont.—p. 534.

Pernicious Anemia with Uric Acid Deposits in the Kidneys: Case. H. B. Burchell, Toronto.—p. 540.

Aneurysm of Aorta, with Rupture and Hemorrhage into Mediastinum and Partial Dissection of Left Parietal Pleura: Case. S. R. Townsend, Montreal.—p. 542.

Primary Aplastic Anemia—Recovery. — Astwood's case with complete recovery presented the characteristics of primary aplastic anemia. Whether or not this recovery will be permanent, only time can tell. To what extent the different remedies used (citrated blood, liver extract, ferric ammonium citrate, brewers' yeast, raw bone marrow, epinephrine, ephedrine) influenced the outcome it is difficult to say, but the author is certain that the patient would have died promptly but for the transfusions, of which there were eight, of about 400 cc. average, given at weekly intervals. The rise in reticulocytes and the gradual improvement which followed the use of ephedrine suggest that it may have exerted some beneficial action on blood regeneration. It is probable, however, that the recovery was spontaneous and that the absence of any heroic measures, the supportive effect of the transfusions and the prevention of infection by good nursing allowed recovery to take place. The concept of complete bone marrow aplasia as necessary to the diagnosis of aplastic anemia is probably false. As spontaneous recovery may occur in some cases, prolonged supportive treatment with repeated blood transfusions is justified.

Ragweed Dermatitis.—Caulfeild believes that the profession in general does not appreciate that definite types of dermatitis may follow the inhalation of substances normally in the air. The results of his investigation of a case of "tulip fingers" have shown the ether-soluble portion of the tulip bulb to be the cause of the dermatitis. The intramuscular injection of this fraction taken up in corn oil prevented the outbreak of a severe dermatitis for the first time in a seasonal exposure of a duration of five years. This ether-soluble fraction in oil gave a less pronounced patch test with another individual who experienced mild symptoms on his seasonal exposure to tulip bulbs. A case of ragweed dermatitis is added to the list of cases already reported. The exciting factor was found to reside in the ether-soluble portion. The attacks occurred for a period of ten years during the early growth of the weed and before the pollen content of the air had appeared in any considerable quantities. During the height of the pollen air content the dermatitis had subsided without the advent of any symptoms of an allergic character. A case of urticaria-like skin and mucous membrane eruption, of a strictly seasonal character, was found to give positive scratch tests to different pollens, but more particularly to ragweed pollen that corresponded to the seasonal air content of the pollens giving positive tests. A positive Prausnitz-Kustner reaction was obtained with a solution of ragweed pollen, whereas patch tests with all fractions of ragweed pollen were negative. A table based on the scratch

and patch tests and the Prausnitz-Kustner reaction attempts to give in graphic fashion the fundamental differences between cases of contact dermatitis and the prevalent conception of allergic or atopic dermatitis.

Canadian Public Health Journal, Toronto

27: 209-260 (May) 1936

Survey of Illness Among the Unemployed in Winnipeg (March 1934 to February 1935, Inclusive). M. R. Elliott, Erickson, Manit.—p. 209.
The Health of Animals Branch and Its Relation to Public Health. A. E. Cameron, Ottawa, Ont.—p. 218.
Standardization of Laboratory Methods Useful in Controlling the Quality of Dairy Products. R. S. Breed, Geneva, N. Y.—p. 222.
The Rôle of Nonfecal Bacteria in Water Supplied to Creameries. D. B. Shutt, Guelph, Ont.—p. 226.
Applied Aspects of Venereal Disease Legislation of Ontario. L. A. Pequegnat, Toronto.—p. 228.

Georgia Medical Association Journal, Atlanta

25: 113-146 (April) 1936

Acute Appendicitis: Factors Influencing the Mortality. D. C. Elkin and W. Glenn, Atlanta.—p. 113.
Septic Peritonitis Following Appendicitis. E. Boling and M. Mitchell, Atlanta.—p. 116.
Irradiation versus Surgery in Breast Lesions. W. P. Nicolson Jr., Atlanta.—p. 120.
Malignant Tumors of Bone. E. L. Bishop, Atlanta.—p. 124.
The Psychology of Prejudice and Mob Action in Tribes and Nations. S. Kahn, Atlanta.—p. 130.

Iowa State Medical Society Journal, Des Moines

26: 231-278 (May) 1936

Treatment of Diabetes with Protamine Insulin. E. B. Winnett, Des Moines.—p. 231.
Advances in Internal Medicine in 1935. J. S. McQuiston, Cedar Rapids.—p. 237.
Hematuria. L. E. Pierson, Sioux City.—p. 241.
Concentration Test as Practical Means of Determining Kidney Insufficiency. J. L. Kestel, Waterloo.—p. 242.
Surgical Treatment of the Stoneless Gallbladder. L. E. Shafer, Davenport.—p. 243.
Colloid Carcinoma of the Bladder: Report of Case. H. P. Lee, Iowa City.—p. 246.
Significance of Jaundice in Biliary Tract Disease. H. L. Beye, Iowa City.—p. 249.
Functional Disorders of Gastro-Intestinal Tract. W. H. Rendleman, Davenport.—p. 253.
Diverticulosis of the Colon. A. W. Erskine, Cedar Rapids.—p. 255.

Johns Hopkins Hospital Bulletin, Baltimore

58: 267-332 (April) 1936

Monocytic Leukemia. C. W. Wainwright and G. L. Duff, Baltimore.—p. 267.
*Experimental Production of Whooping Cough in Chimpanzees. A. R. Rich, P. H. Long, J. H. Brown, Eleanor A. Bliss and L. E. Holt Jr., Baltimore.—p. 286.
Diagnosis of Obscure Fever: II. Diagnosis of Unexplained High Fever. L. Hamman and C. W. Wainwright, Baltimore.—p. 307.

Experimental Whooping Cough in Chimpanzees.—Rich and his co-workers produced a condition similar in all respects to whooping cough, characterized by coryza followed by a protracted, paroxysmal cough typical of that of pertussis, associated with lymphocytosis and the development of positive complement fixation toward the Bordet-Gengou bacillus, in the chimpanzee by the oral inoculation of unfiltered tracheal exudate from human pertussis. Bordet-Gengou bacilli were recovered on cough plates at the height of the cough. A precisely similar condition has been produced in the chimpanzee by oral inoculation with pure cultures of Bordet-Gengou bacilli. The inoculation of apes with bacteriologically sterile blood and filtered respiratory secretions obtained from each of four cases of pertussis early in the disease was followed by the appearance of a catarrh of the upper respiratory tract without cough. In the one instance in which an attempt was made to transfer the agent from one ape to another by means of a bacteriologically sterile filtrate of the nasopharyngeal secretions, the attempt was successful. The nature of this filtrable agent is discussed, but the authors' limited data do not permit them to conclude that it is a specific filtrable virus that acts to increase susceptibility to infection with the Bordet-Gengou bacillus, analogous to the action of the filtrable virus of swine influenza or canine distemper. Its relation to pertussis is undetermined. At present one can say only that the Bordet-Gengou bacillus, acting alone, is capable of producing the characteristic clinical manifestations of whooping cough in the ape.

Kentucky Medical Journal, Bowling Green

34: 169-224 (May) 1936

*Quinine Amblyopia. J. H. Simpson, Louisville.—p. 173.
Laboratory Aspects of Anemia. W. H. Allen, Louisville.—p. 177.
Anemia, Clinical Aspects. A. T. Hurst, Louisville.—p. 180.
Treatment of Anemia. E. C. Humphrey, Louisville.—p. 183.
Modern Trends in Treatment of Pyelitis. L. Coleman, Richmond.—p. 190.
Social Trends in Medicine. J. D. Northcutt, Covington.—p. 193.
Modern Treatment of Breast Tumors. J. D. Hancock, Louisville.—p. 200.
To the Medical from the Legal Profession. E. Hamilton, Louisville.—p. 208.
How Do Drugs Really Act? C. W. Reynolds, Covington.—p. 212.
Public Health Work and Its Relationship to the General Practice of Medicine. W. M. Chapman, Glasgow.—p. 213.
Otolaryngology for the General Practitioner. H. G. Stambaugh, Ashland.—p. 216.

Quinine Amblyopia.—Simpson reports a case of quinine amblyopia. The patient's normal sense of light has not returned in almost five years and she has difficulty in getting around at night. The diagnosis of the condition depends on the history of quinine ingestion and the following five points set forth by Ball: 1. Vision is lost completely, almost suddenly. 2. There are attenuated retinal vessels and white papillae, and often there is a remarkable recovery of function. 3. Central vision returns first, while peripheral vision is restored slowly and seldom if ever completely. 4. The color sense is often damaged; if it returns at all, it does so first at the center and then extends peripherally. 5. Diminution of the light sense, with resultant night blindness, is a frequent sequence of quinine poisoning. Though the prognosis is favorable to the restoration of good central vision, no doubt in certain cases good central vision is not regained. In the prevention of this disease, when a large amount of the drug or a long continued dosage of a smaller amount is contemplated, the history of an idiosyncrasy is a warning, which may be elicited by Baener's skin test as recommended by Rucker using a 10 per cent solution of quinine bisulfate.

Ohio State Medical Journal, Columbus

32: 385-492 (May 1) 1936

Clinical Significance of Jaundice. L. Schiff, Cincinnati.—p. 401.
Study of One Hundred and Fifty-Eight Consecutive Cases of Breast Malignancy. G. P. Sims and C. S. Hamilton, Columbus.—p. 406.
Observations on Ovarian and Pituitary Endocrinopathies, with Especial Reference to Basophil Adenoma. M. Douglass, Cleveland.—p. 411.
Neurologic Complications of Acute and Chronic Mastoiditis. C. H. Bayha, Toledo.—p. 417.
Menopause Syndrome. C. W. Sawyer, Marion.—p. 421.
Observations on Cataract Extraction. R. S. Binkley, Dayton.—p. 425.
*Has the Use of Acetylsalicylic Acid Been a Factor in Increase in Fatal Heart Disease? H. C. Temple, Alliance.—p. 429.
The Asthmatic Child: Methods of Study and Results of Treatment. J. A. Rudolph, Cleveland.—p. 430.
Psychologic Approach to Reading Disabilities. B. Crider, Cleveland.—p. 434.
Acute Middle Ear Disease. J. R. Dowling, Massillon.—p. 436.
Fractures: Form or Function? B. J. Hein, Toledo.—p. 440.
Case Record Presenting Clinical Problems: "An Atypical Influenza." R. I. Fried and H. L. Reinhart, Columbus.—p. 441.

Acetylsalicylic Acid as a Factor in Heart Disease.—Temple believes that the general increase or excessive use of drugs is at least in part responsible for the increase in fatal heart disease. It has become a common practice among many people to make free and unlimited use of acetylsalicylic acid as a cure-all for every ache or pain to which human flesh is heir. The drug is classified in the general group of coal-tar derivatives, among which are acetanilid, antipyrine, acetophenetidin and other well known heart depressants. The physiologic action of any of this general group or class of drugs is to reduce arterial tension and weaken the contractility or elasticity of the muscular fibers of the heart. By the excessive and continuous use of acetylsalicylic acid the heart muscles become soft and flabby, the heart valves relax and lose their power to perform their normal function properly and, by degrees, the blood begins to regurgitate with each heart pulsation back into the blood vessels, thus gradually resulting in a valvular heart lesion, which, when once established, is never cured but continues to grow worse and worse until death results. Acetylsalicylic acid is potentially a dangerous drug, and its use as a

home remedy is a menace to the good health of the people. Its indiscriminate use, as urged in advertisements of all types as a harmless and innocent drug, is inimical to public health and should be discouraged. The question as to what extent the excessive use of acetylsalicylic acid has influenced the rapid increase of fatal heart disease among the people since 1900 should command the attention of health authorities.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

44: 255-312 (May) 1936

*Surgical Treatment of 105 Cases of Diaphragmatic Hernia. S. W. Harrington, Rochester, Minn.—p. 255.
Ureteral Diverticula. A. Brown, Omaha.—p. 270.
*Postural Prevention of Peritonitis After Operation on Biliary Tract. W. T. Coughlin, St. Louis.—p. 279.
Congenital Arteriovenous Communication. W. J. Carson, Milwaukee.—p. 283.
Irradiation versus Surgery in Treatment of Certain Surgical Conditions, Including Operable Malignant Tumors: Comparison of Results. P. Campiche, San Francisco.—p. 287.
Lingual Thyroid: Comprehensive Review: Division VI. M. L. Montgomery, San Francisco.—p. 303.

Surgical Treatment of Diaphragmatic Hernia.—Harrington believes that operative replacement of the herniated viscera in the abdomen, with repair of the abnormal opening in the diaphragm, is the only treatment that ensures complete relief of symptoms. The hernial opening is best repaired through an abdominal approach, with the use of fascia lata and interrupted linen sutures. Temporary or permanent interruption of the phrenic nerve is of value as a procedure preliminary to radical closure of large openings, particularly when there is deficiency or loss of structure of the diaphragm. Radical repair of the hernia was carried out in ninety-seven cases. There were ninety-eight patients who recovered from operation. Of the eight treated palliatively by interruption of the phrenic nerve, one has since died of angina pectoris; two died of causes not definitely ascertained, but which apparently were attributable to cardiac conditions, for they had had myocardial degeneration at the time of the operations, and the remaining five have obtained partial relief of symptoms. Ninety patients recovered from radical operative repair of the hernia; eighty-eight patients have been completely relieved of symptoms, and two have had a return of symptoms following recurrence of the hernia. In one of the cases, recurrence developed following an influenzal type of pneumonia three months after operation, the recurrence being caused by the severe strain of coughing. In the other case there is no known cause for the recurrence. All patients have been examined roentgenologically every six months to a year after operation. There are no serious physiologic effects from repair of these defects in the diaphragm. The diaphragm which has been operated on functions normally after repair unless the phrenic nerve or some of its branches have been destroyed, paralyzing that portion of the diaphragm supplied by them.

Prevention of Peritonitis After Operation on Biliary Tract.—Coughlin points out that in the prevention of peritonitis the falciform ligament becomes a structure of great value for the prevention of adhesions between the raw surface of the liver and the adjacent stomach and duodenum if it is properly utilized, its free edge sewed to the peritoneum covering the common duct, then skirting the duodenum and catching the gastrocolic omentum below. If with the drain reaching from the foramen of Winslow to the surface by the shortest route, which is out through the upper end of the wound, the patient is turned on the left side, all secretions from the region of the site of operation will flow down hill. They cannot spread to the left because of the falciform ligament and the use that has been made of it, and they will not accumulate round the site of operation and spread, carrying virulent bacteria perhaps to all quarters of the peritoneal cavity. In twenty-four hours the area will have become "walled off." For drainage after operations on the biliary tract the patient is turned on the left side. The abdomen is turned slightly toward the bed and this position is maintained at least for the first twelve hours and by preference for twenty-four. The author has been using this method since 1912. He has records of 287 cases that required drainage, with only one patient who died of peritonitis, and this patient would not remain in a position to favor drainage.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

48: 173-220 (April) 1936

*Streptococcic Dermatitis. J. Kinnear.—p. 173.
Hemorrhagic Telangiectasia of the Osler Type—"Telangiectatic Dysplasia": Isolated Case, with Discussion on Multiple Pulsating Stellate Telangiectases and Other Striking Hemangiectatic Conditions. F. P. Weber.—p. 182.

Streptococcic Dermatitis.—Kinnear asserts that until recently the streptococci causing impetigo and streptococcic dermatitis have not been differentiated, and in view of the marked differences between the clinical appearances of these diseases this has led many to reject the streptococcic origin of the latter. The active stage of streptococcic dermatitis is characteristic. The red, glazed area with its abundant exudation of serum from the whole surface is quite easily distinguished from both eczema and other forms of dermatitis. The less active phase of the disease, streptococcic pityriasis, is also characteristic. The scaling is a fine lamellar exfoliation and may be profuse. Occasionally this stage of pityriasis is the primary stage of the disease without a preceding dermatitis; frequently, when the scalp is acutely involved, patches of dry pityriasis are found on the body; but it is most commonly found as the active stage is passing and is almost invariably at the margins of an acute lesion, especially in the scalp above an intertrigo behind the ear. All gradations between these two phases may be found, frequently in the same patient in different parts of the lesion. Streptococcic dermatitis attacks the folds of the skin and spreads from the folds to the neighboring skin and, as the disease is brought under control, it gradually contracts till again the folds alone are affected. Impetigo has not the same tendency to affect the folds. The lesions of impetigo are comparatively small, and, when a large area is affected, one can see that it is by numerous distinct elements. On the other hand, the continuity of the lesion in streptococcic dermatitis is evident. Vesicle formation such as occurs in impetigo is absent in streptococcic dermatitis. As a rule it is not difficult to distinguish streptococcic from other forms of intertrigo. The extent of this streptococcic infection may vary from a tiny lesion at the upper end of the retro-auricular fold to a generalized involvement of the whole surface of the body. It may disappear spontaneously in a few days or last for years. For treatment during the acute stage a nonirritating antiseptic in solution is best. In the less active stage coal tar is invaluable. The causal organisms of impetigo and of streptococcic dermatitis are entirely different types of streptococci. The author found that one could isolate from impetigo a hemolytic streptococcus, whereas from streptococcic dermatitis an anhemolytic streptococcus was obtained. In cases of a mixed type both streptococci were found.

British Journal of Radiology, London

9: 215-286 (April) 1936

Measurements of Low Voltage X-Rays (Chaoul Technic). W. V. Mayneord.—p. 215.
Developmental Abnormalities of Skeleton. J. F. Brailsford.—p. 239.
Evaluation in Roentgens of Barium-Platinocyanide Pastille Dose for X-Rays and Gamma Rays. G. W. C. Kaye and W. Binks.—p. 272.
Bilateral Sesamoids Near External Lateral Ligament of the Ankle. A. H. Gregson.—p. 281.

British Journal of Tuberculosis, London

30: 53-108 (April) 1936

*When Should Refills Be Stopped? J. C. Dundee.—p. 55.
Tuberculosis in Egypt. E. Zimmerli.—p. 62.
Remarks on Clinical Estimation of Resistance in Pulmonary Tuberculosis. D. P. Marais.—p. 72.
Small Localized Artificial Pneumothorax. B. Hudson and F. L. Wollaston.—p. 81.
Erythema Nodosum and Cervical Gland Tuberculosis: Three Illustrative Cases. B. C. Thompson.—p. 84.

When Should Refills Be Stopped?—Dundee believes that the extent and nature of the original lesion is the most important factor in the decision as to when treatment should be

stopped. The smaller the original lesion, the more confidence can one have regarding expansion. Patients who continue to have intermittent positive sputums ought to have their treatment continued indefinitely. A complete roentgen serial of each case should be in the hands of the current operator. When the patient leaves a sanatorium or changes doctors, all his roentgenograms should be transferred with him. The most important change to look for roentgenographically in lung reexpansion is a reappearance of excavation, for such an occurrence warrants an immediate reversal of treatment, with closure of the cavity. Lesions that have undergone little resolution during treatment, contain little or no calcium and have made little or no attempt at stellar formation or fibrosis, and yet have no perifocal exudate, should be considered carefully before reexpansion is resorted to. Such innocent-looking lesions, if large, undoubtedly contain tubercle bacilli. If these lesions have not healed under pneumothorax, they certainly will not do so after reexpansion, and they may go on to central caseation, followed by liquefaction and excavation, if collapse is not maintained. The development of a serous effusion toward the end of artificial pneumothorax treatment should be prevented from interfering with the desired degree of collapse by performing frequent aspirations and necessary air replacements. The younger the patient, the more inclined is the author to prolong pneumothorax treatment. Relapses following reexpansion are more common during the years from 15 to 30 than later. The patients who have to return to hard manual labor should have pneumothorax treatment continued considerably longer than other patients, and a larger proportion of this group than of any other should have pneumothorax continued indefinitely. The more contacts there are to any particular pneumothorax case, the more careful one has to be about terminating the treatment. A considerable number of relapses occur in women after reexpansion probably because of pregnancy and the care of the child. When there has been a great deal of original lung destruction, pregnancy is not advisable. When the involvement has been less and the economic and home conditions are satisfactory, pregnancy may be considered safe, provided pneumothorax is continued for at least one year after full term. This applies to patients in whom pneumothorax has been satisfactory and who have had a negative sputum for three years.

British Medical Journal, London

1: 737-780 (April 11) 1936

Technic of Gastroscopy. H. C. Edwards.—p. 737.
*Latent Adolescent Pulmonary Tuberculosis. R. C. Wingfield and A. Margaret C. Macpherson.—p. 741.
Organic Basis of Psychosis: Report of Case. N. M. Dott and W. M. C. Harrowes.—p. 744.
Agranulocytic Angina: Case of Relapsing Type. A. D. Briscoe.—p. 746.
*Some Experiments with Protamine Insulinate. R. D. Lawrence and Nora Archer.—p. 747.

Latent Adolescent Pulmonary Tuberculosis.—Wingfield and Macpherson observed that in taking histories of recently diagnosed adult cases there is often a suggestion of a definite period of ill health in adolescence which might be ascribed to active pulmonary tuberculosis but which had not been recognized as such. As examples they mention pleurisy, atypical pneumonia or bronchitis, anemia and nervous breakdown for no known cause. Perhaps the extensive lesions of adult disease are really in many cases deposited during adolescence with the accompaniment of slight or unexplained constitutional disturbance: that these lesions are carried unrecognized, perhaps extending slowly and without symptoms until they make their presence known in adult life either by reason of their spread past a definite point or because some environmental cause has allowed of their reactivation. If this hypothesis were true, the roentgen examination of a sufficiently large unselected sample of the adolescent working-class population in normal health should reveal a proportion of cases with definite lesions. Further, the incidence of these lesion carriers should closely approximate the incidence of clinically manifest tuberculosis in the adult working-class population between the ages of 21 and 40. Scholars in all the county secondary schools were approached and in this way 1,350 cases of both sexes between the ages of 14 and 18 years were examined. Employers of adolescent labor were interviewed and 1,031 more cases were obtained of the adolescent, urban and semiurban working-class population between the ages of 14 and 21. These adolescents were, so far as the authors knew, in normal health. The authors considered positive those roentgenograms in which there were unmistakably abnormal shadows, indicating definite pathologic changes in the lung parenchyma, having the appearance that was compatible with, and usually associated with, tuberculous lesions of the adult type. In the 2,381 roentgenograms there were fifteen (0.65 per cent) positives. In addition there were eighteen abnormal roentgenograms, and ten of these showed shadows probably due to tuberculous lesions. Therefore a definite incidence of 0.65 per cent was found and a possible incidence of 1.08 per cent. Similar investigations undertaken by workers in other countries revealed a much higher incidence of latent lesions. Such lesions are always liable to spread and to intensify, even though they remain stationary and symptomless for long periods. A proportion of these adolescents with their latent lesions will sooner or later exhibit clinical disease. The incidence of these latent lesions among adolescents approximates closely the estimated incidence of clinical disease among adults. If these adolescent carriers can be detected it is comparatively easy to handle them so that they will never develop clinical disease or so that the development in them of clinical disease will be postponed until much later in life—every year of postponement making such development less likely.

Experiments with Protamine Insulinate.—On the basis of their studies, Lawrence and Archer conclude that protamine insulinate acts more slowly and for a much longer period than ordinary insulin and that a large dose can act for more than two days. It is much weaker in dealing with carbohydrate food and usually cannot prevent hyperglycemia after meals. In contrast, its action on endogenous sugar is nearly as rapid and good as ordinary insulin. It causes less symptoms of hypoglycemia than ordinary insulin, even at the same blood sugar concentration. Protamine insulinate is certainly absorbed more slowly from the subcutaneous tissues. It therefore has qualities which promise great use in severe cases of diabetes with oscillating blood sugars and rapidly recurrent ketosis. On the other hand, it is not strong enough in its action to control ingested carbohydrate, so that the use of ordinary insulin before carbohydrate meals and protamine insulinate in the evening has been advocated and is necessary to obtain full control of the diabetic condition. Another insulin preparation combining the qualities of ordinary and protamine insulinate would obviously be more useful than either. Protamine insulinate, great though its advantage may be in some cases, is not generally obtainable for clinical use in England and is indeed still in the experimental stage.

Glasgow Medical Journal

7: 153-200 (April) 1936

Nutritional Anemia in Infancy and Childhood. W. T. W. Paxton.—p. 153.
Puerperal Jaundice. J. Grant and J. H. Miller.—p. 165.

Journal of State Medicine, London

44: 187-248 (April) 1936

Our Mechanistic Age. T. Oliver.—p. 191.
Public Health Administration in Bermondsey (Past and Present). D. M. Connan.—p. 199.
Some Common Diseases of Ear, Nose and Throat. M. O'Regan.—p. 210.

Lancet, London

1: 823-876 (April 11) 1936

Medical Problems in Mineral Metabolism. R. A. McCance.—p. 823.
Differential Diagnosis of Diseases of Colon (Dysentery and Colitis). P. Manson-Bahr.—p. 830.
*Neuritis in Pregnancy Successfully Treated with Vitamin B_1. G. W. Theobald.—p. 834.
Male Hormones and the Question of Accessory Substances: Note. R. Deanesly and A. S. Parkes.—p. 837.

Treatment of Neuritis in Pregnancy with Vitamin B_1.—Theobald successfully treated five cases of neuritis of pregnancy by dietetic measures, four of them solely by the administration of vitamin B_1 (2,250 units) concentrate. All the patients complained of numbness, tingling, pins-and-needles and, with the exception of one, of pain which was worse by night. The arms and hands were affected in all the cases, and one side

more than the other. Two of these patients suffered in addition from deficiency of vitamin D in their diets. It is impossible to say whether these symptoms represent an early stage of the "toxic neuronitis" of pregnancy. Pregnancy offers opportunities for studying the effects of vitamin and other deficiencies in the diet with the precision of a laboratory experiment. The results reported may be held to support the dietetic deficiency hypothesis of the toxemias of pregnancy.

1: 877-930 (April 18) 1936

Malignancy with Illustrations from Pathology of Mamma. R. Muir.—p. 877.
Vitamins in Human Nutrition: Excretion of Vitamin B_1 in Human Urine and Its Dependence on Dietary Intake. L. J. Harris and P. C. Leong.—p. 886.
*Glycosuria and Acetonuria in Subarachnoid Hemorrhage: Report of Four Cases. E. J. S. Woolley.—p. 894.

Glycosuria and Acetonuria in Subarachnoid Hemorrhage.—Woolley reports four cases of hemorrhage into the subarachnoid, in which acetone and sugar were found in the urine, and one presented a clinical picture which resembled in some respects that of hyperglycemic coma. Apart from the fact that sugar and acetone were demonstrated in the urine and that all four illnesses were fatal, these cases had little in common. In the three in which a postmortem examination was made the only common observations were extensive destruction of brain substance and the presence of blood or deeply blood stained fluid in the cerebral ventricles; the site of the hemorrhage was different in each case. In cases 2, 3 and 4 there was no emesis before admission, and in two of them the urine was examined within three hours of the ictus. In case 3 a large meal had recently been taken. It seems, therefore, that the ketonuria is not the result of starvation. The possibility that these patients were the subjects of undiagnosed diabetes mellitus cannot be excluded. There is no evidence in support of such a conjecture, except for the history of lassitude in case 3. It is known that the urine in case 1 had been sugar free a few weeks before the final illness. The mechanism whereby ketonuria is produced in these cases is obscure. It seems that the hyperglycemia following either puncture or pathologic cerebral injury is the result of sympathetic stimulation. It is possible that the ketonuria is the result of a massive increase in the secretion of epinephrine. An alternative theory involves the assumption that there is pancreatic dysfunction as the result of deranged nervous control. It has been shown by Clark that the islets of Langerhans normally receive inhibitory stimuli through the vagi. If the centers of origin of such stimuli were themselves stimulated as the result of hemorrhage, a true diabetes might result. Be the explanation of the ketonuria what it may, it is in the difficulty of diagnosis to which it may give rise that the real interest lies. The coma following intracranial hemorrhage may, in the absence of signs directing the attention to the central nervous system, simulate the coma of hyperglycemia so closely that differentiation of the two conditions may be extremely difficult. It is unusual for the odor of acetone to appear in the breath following subarachnoid hemorrhage, but its presence has been described. In none of the cases recorded has altered intra-ocular tension been found. A negative ferric chloride test is common in these cases and, since it must be extremely rare in hyperglycemic coma, it is valuable in differentiating the two conditions.

Medical Journal of Australia, Sydney

1: 417-450 (March 28) 1936

Acquired Active Immunity in the Ox to Cysticercus Bovis. W. J. Penfold, H. B. Penfold and Mary Phillips.—p. 417.
Progress in Psychiatry: 1910-1935. W. S. Dawson.—p. 423.
Treatment of Pink Disease. G. B. Sweet.—p. 430.

1: 451-488 (April 4) 1936

Medical Survey in Papua: Report of First Expedition by the School of Public Health and Tropical Medicine to Papua. F. W. Clements.—p. 451.
Treatment of Plumbism: Note. F. F. Pincus.—p. 463.
Cone Shell Mollusk Poisoning: Report of Fatal Case. H. Flecker.—p. 464.
Use of Gentian Violet (Aqueous Solution) in Skin Diseases. F. C. Florance.—p. 466.
Relationship Between Dental Infection and Nasal Sinuses. N. M. Cuthbert.—p. 467.

Archives de Médecine des Enfants, Paris

39: 265-328 (May) 1936

Motor Disorders in Normal and Abnormal Child. G. Heuyer and J. Roudinesco.—p. 265.
*Immunization Against Measles by Placental Blood. J. Salazar de Souza.—p. 282.
Hypochloridemia, Azotemia and Osmotic Regulation. D. Moritz.—p. 296.

Immunization Against Measles.—Salazar de Souza states that a mild epidemic of measles in Lisbon between June 1934 and May 1935 allowed him to continue his investigations of immunization in measles by means of placental blood. Between June and September he immunized forty-eight patients, some of them with recent placental blood, others with stock blood, and of this number obtained 77 per cent immunization. Further observation of measles developing in those immunized by this means persuaded him to change his technic of preparation of the placental blood. He used sodium ethylmercurithiosalicylate in treating the blood instead of solution of formaldehyde, since he found that the immunizing properties of the serum were less affected by the former. The dose used in this epidemic was from 4 to 5 cc. in the first 104 cases and from 6 to 6.5 cc. in the last eleven. In the last group, with the higher dosages he obtained 100 per cent immunization while in the first group he had only 75.9 per cent immunization; i. e., twenty-five cases of measles. As a result of these studies he believes that, when large enough doses of properly treated placental blood are used in immunization, the method will furnish a high percentage of good results.

Paris Médical

1: 361-396 (May 2) 1936

Heart Diseases in 1936: Annual Review. P. Harvier and R. Boucomont.—p. 361.
General Sensations of Humoral Disturbances in Course of Permanent Arterial Hypertension. G. Carrière and C. Huriez.—p. 371.
Daily and Prolonged Intravenous Injections of Ouabain. E. Benhamou.—p. 375.
Severe Cardiovascular Collapse in Course of Pulmonary Embolism. P. Soulié.—p. 381.
*Acute Venous Thromboses Simulating Arterial Embolism of Limbs. M. Audier.—p. 384.

Venous Thrombosis Simulating Arterial Embolism.—According to Audier, the differential diagnosis between venous thrombosis and arterial embolism of the limbs, while often difficult, is important from the standpoint of treatment and prognosis. A positive diagnosis is based on a group of symptoms resting on the conception that an arterial spasm occurs during the course of acute venous thrombosis. The resultant pain is severe and intense. In the lower limb it involves Scarpa's triangle and radiates along the course of the arteries. It is followed by rapidly developing cyanosis of the foot and lower part of the leg. This cyanosis may precede the development of lividity. The coldness of the limb occurs later and inconstantly. Edema is practically constant and more or less intense but develops rapidly and progressively. The presence of early edema of sudden onset and progressive evolution strongly suggests acute venous thrombosis rather than embolism. After acute thrombosis has been determined with reasonable definiteness it is important to institute treatment rapidly, aimed at the arterial spasm. The most commonly employed method of accomplishing this end is injection of acetylcholine, hyperelevation of the foot, immobilization, and warming of the involved limb.

Presse Médicale, Paris

44: 729-744 (May 2) 1936

Treatment of Gastric Allergies and Erosive Gastritis. H. Thiers and R. Chevallier.—p. 729.
*Treatment of Bronchial Asthma by Insulin Shocks. J. Wegierko.—p. 731.

Treatment of Bronchial Asthma by Insulin Shocks.—About forty patients suffering from bronchial asthma and treated by means of insulin shock have been observed by Wegierko for more than a year. His procedure was to inject 40 units of insulin subcutaneously before breakfast or six or seven hours after the last meal. This was done preferably during an attack of dyspnea from the asthma. Usually sugar was given to the patient as soon as the dyspnea had entirely

disappeared. In less severe cases the shocks were spaced every three to five days. If the dyspneic attacks were more frequent, more frequent shocks were given. In the most severe cases, shocks were given daily and sometimes twice a day until considerable improvement was noted. No bad effects have been observed, but the author has not employed this method of treatment in patients past the age of 70, in those having marked circulatory insufficiency or in cases of pulmonary tuberculosis. From the cases observed it appears that insulin shock stops the attack of dyspnea due to bronchial asthma and that after a number of shocks the character of the bronchial asthma is changed, the attacks of dyspnea are diminished in intensity, and in some cases they disappear completely. The mechanism of action, according to the author, is by means of bronchial dilatation. He believes that the method of treatment may be employed in other disorders characterized by smooth muscle contractions, such as hepatic colic, nephritic colic, migraine and analogous conditions. It may also be useful in allergic disorders. This method of treatment offers a wide field for research.

Revue Méd.-Chir. des Maladies du Foie, Paris

11: 97-176 (March-April) 1936

Roentgenologic Diagnosis of Intrahepatic Biliary Lithiasis. P. Mallet-Guy, R. Froment and M. Damez.—p. 97.
*Allergic Disorders of Gastro-Intestinal Tract, Liver and Gallbladder. E. Urbach.—p. 116.
Hepatic Insufficiency Demonstrated by Galactosuria Test in Course of Bacillary Polyserositis. R. Picard, P. Perrin, Charbonel and Le Seach. —p. 145.
Spleen in Mediterranean Kala-Azar: Clinical, Anatomic and Therapeutic Study. P. Giraud.—p. 157.

Allergic Disorders of the Gastro-Intestinal Tract.—Urbach states that the disorders which have the character of an intestinal allergy are those in which intestinal, gallbladder or stomach symptoms are produced by allergenic substances. Sensitization may be produced by the oral introduction of the allergen, sensitization of the digestive organs from an allergen introduced parenterally, or sensitization from an allergen itself developed in the intestinal canal. Investigation of such disorders involves the taking of a careful history, the relief of the pain or spasm by an injection of epinephrine, and alimentary tests with the suspected allergens. Treatment may be divided into specific, metaspecific or symptomatic specific therapy. Specific therapy may be instituted by the administration of slowly increasing quantities of the known allergen or by desensitization immediately before the meal. Metaspecific desensitization consists in the production of an anaphylactic shock by means of horse serum and in many instances leads to recovery. The symptomatic treatment utilizes preparations of epinephrine in attempting to avoid acute attacks, and sometimes favorable results have been obtained by colonic lavage.

Pensiero Medico, Milano

25: 89-120 (April) 1936

*Phagocytic Power of Free Cells in Pleuritic Exudates. G. B. Audo-Gianotti.—p. 91.
Placental Extracts in Hypogalaction. G. Parmeggiani.—p. 97.
Clinical Value of Dilution Test as Functional Test of Liver. T. Guido. —p. 103.

Phagocytic Power of Free Cells in Pleuritic Exudates.—Audo-Gianotti studied the phagocytic power of free cells in pleuritic exudates by means of injections of 1 cc. of a 10 per cent aqueous solution of india ink into the fluid of the pleuritic effusion. The determinations were made in ten patients suffering from exudative pleuritis of varying etiology. The author concludes that certain free cells in pleuritic exudates have phagocytic power, which depends on the type, evolutional stage and age (phase of degeneration) of the cells. Phagocytosis is intense by cells of a histoid origin (those originated in a reaction of the connective subpleural tissues to the local inflammation), less intense by mesothelial, monocytoid and granulocytoid cells (those originated in the local reaction of the serous membranes and other pleural structures) and absent in lymphocytoid cells (those originated in blood and inflammatory cells). The failure of free cells to phagocytose the granules of inert colored substances previously injected into the fluid depends on the presence of lymphocytosis, which is a characteristic of exudates of tuberculous pleuritis. The lack of phagocytosis is of diagnostic value in tuberculous pleuritis, when the exudates are already formed and have remained in the pleura for a certain time. In these cases the exudates are lymphocytic. Early in the development of tuberculous pleuritis, as well as in acute forms of the disease, however, phagocytosis in the exudates is intense, owing to the fact that the latter are in the period of formation during which the pleura reacts to the inflammatory process with the production of histoid and granular cells. It is only later, on the evolution of tuberculous pleuritis, that the phagocytic power of the exudates disappears through modifications of the cytologic structure of the exudates.

Policlinico, Rome

43: 911-954 (May 18) 1936. Practical Section

Embolism of Pulmonary Artery Cured by Embolectomy: Case. P. Valdoni.—p. 911.
*Acute Polyarthritis in Course of Primary Malaria, Developed near Florence: Case. A. Terzani and Lia Torelli.—p. 918.
Modern Trends in Therapy of Cardiac Diseases. G. Galli.—p. 924.

Polyarthritis and Primary Malaria.—Terzani and Torelli state that there is a type of malarial pseudorheumatism which develops in the course of either a primary or a recurrent attack of malaria, early or during convalescence. Arthritis, appearing early in certain forms of malaria with a type of nearly continuous fever, does not modify the febrile curve, which changes to the intermittent type regardless of the presence of arthritis. The polyarthritic symptoms are so predominant that a diagnosis of malaria is overlooked, especially in cases of primary infection with a febrile curve of nearly continuous type. The articular symptoms are different from those of acute articular rheumatism: there is no history of angina, the knee joints are not primarily involved and the joint or joints involved are affected all through the disease. Endocarditis complicates the disease only in exceptional cases. Salicylates fail to relieve the patients. The nature of the disease is determined by the results of the treatment both on the malarial and the articular symptoms rather than by the articular picture, which is different from that of malarial neuritis, myositis, osteomyelitis and osteitis. The sojourn of the patients in thermomineral spas is not indispensable to obtain complete recovery, which is obtained, however, in a short time by the administration of an intensive quinine treatment, either by itself or in association with salicylates, sulfur or iodine. A case is reported in a man aged 63, who lived in a nonmalarial zone near Florence. The metatarsophalangeal joints were primarily involved and the shoulder joint was intensively and constantly affected all through the disease.

Riforma Medica, Naples

52: 601-636 (May 2) 1936

*Contraction of Spleen by Intravenous Injections of Epinephrine in Purpura Haemorrhagica. P. Riolo.—p. 603.
Metastasis of Vagina from Renal Cancer: Case. G. Manzoni.—p. 606.

Contraction of Spleen in Treatment of Hemorrhagic Purpura.—Riolo reports two cases of hemorrhagic purpura with splenomegaly and thrombopenia in which a permanent cure was obtained by repeated contraction of the spleen produced by daily intravenous injections of increasing doses of from 0.01 to 0.1 mg. of epinephrine. The last dose was repeated for twenty consecutive days. After that the blood picture returned to normal and the spleen to its physiologic limits and the patients were permanently cured, as proved by follow-up examinations for a period of a year and a half. The author believes that the favorable results of the treatment are due to the fact that it controls both thrombopenia and the lack of tonus of the capillaries of vagal origin, which are the two pathogenic factors of hemorrhagic purpura. Epinephrine regulates the functions of the spleen until they return to normal. By means of contraction the organ is forced to expel into the blood stream a greater number of platelets. Epinephrine decreases the lytic activity of the spleen on blood platelets (which is increased in hemorrhagic purpura), stimulates the bone marrow to the formation of a larger number of blood cells and increases the vascular tonus through the sympathetic. The author believes that the treatment is especially indicated in hemorrhagic purpura associated with splenomegaly.

Prensa Médica Argentina, Buenos Aires

23: 967-1024 (April 15) 1936. Partial Index

Thoracoplasty: Finochietto's Paradoxical Incision. R. Finochietto.—p. 967.
Metatarsotarsal Luxation: Case. V. C. Girardi and A. R. Isola.—p. 972.
*Counting of Platelets in Gastric Cancer. V. A. Franco.—p. 977.
Humoral Theory of Origin of Diseases. J. Moreno.—p. 988.
Diffuse Peritonitis: Treatment. W. Benthin.—p. 1004.

Counting of Platelets in Gastric Cancer. — Franco counted the platelets in eighteen patients suffering from gastric cancer. In all the cases the number of platelets per cubic millimeter of blood was normal. The clinical diagnosis of gastric cancer was confirmed in all cases by the evolution of the disease and by the performance of either an operation or a necropsy. On the basis of his results and of the fact that thrombocytopenia is a constant blood alteration in patients suffering from pernicious anemia, the author ascribes value to the counting of platelets in the differential diagnosis of pernicious anemia and gastric cancer and advises further work in this field for verification of his statement.

23: 1025-1082 (April 22) 1936

Primary Chorio-Epithelioma of Fallopian Tube: Case. O. L. Bottaro, O. E. Arrillaga and A. Bianchi.—p. 1025.
*Treatment of Gastroduodenal Ulcer by Intravenous Injections of Sodium Benzoate (Bazzano's Method). J. J. Beretervide, D. Di Benedetto and D. Barrios.—p. 1035.
Pneumococcic Peritonitis. O. L. de Goycoechea.—p. 1041.
Fontanels in the New-Born. F. Ugarte.—p. 1055.
Pathology of Meckel's Diverticulum: Diverticulitis in Child; Case. I. Diaz Bobillo.—p. 1061.

Injections of Sodium Benzoate in Treatment of Gastroduodenal Ulcer.—The work of Beretervide and his collaborators was to verify the value of the intravenous injections of sodium benzoate (Bazzano's method) in the treatment of gastroduodenal ulcers. The authors' patients were placed in two groups, in which the action of sodium benzoate on the gastric secretion and the clinical evolution of patients treated by the injections were investigated. In the first group of patients (ten) the action of the drug on the gastric secretion was investigated by determining the acidity of the gastric secretion, obtained by fractional catheterization before and after administration of an intravenous injection of 2 cc. of a 25 per cent solution of sodium benzoate. Free and total chlorhydric acidity rose early after the injection in five of the patients, late in two and diminished in three. The second group (sixteen patients) were treated by the administration of a daily intravenous injection of 2 cc. of a 25 per cent sodium benzoate solution, varying between twenty and thirty injections. Fourteen patients in this group were suffering from either gastric or duodenal ulcers and two from hyperchlorhydria associated with gastritis. The results of the treatment were negative in eleven patients out of the group of the fourteen with ulcer and favorable in one, and the two other patients disappeared from observation. The treatment gave satisfactory results in one of the cases of hyperchlorhydria and gastritis and failed in the other one. The authors conclude that the intravenous injections of sodium benzoate are not efficient in the treatment of gastric and duodenal ulcers.

Archiv für Gynäkologie, Berlin

160: 447-624 (April 2) 1936. Partial Index

*Thyroid and Pregnancy. A. Pohl.—p. 447.
Hypophyseal Tumor and Pregnancy. R. Reckmann.—p. 454.
*Deaminating Function of Human Placenta. J. Botella-Llusiá.—p. 467.
Functional Test of Ovaries Several Years After Hysterectomy. H. Siegmund.—p. 472.
*Adrenal Cortex and Sexuality. H. O. Neumann.—p. 481.
Mucous Membrane Changes (Metaphasia) of Uterus in Continuous Administration of Estrogenic Preparations. P. Grumbrecht.—p. 525.

Thyroid and Pregnancy. — According to Pohl, the functional activity of the thyroid is slightly increased during pregnancy. The changes in the thyroid, characteristic for pregnancy, can be produced experimentally by small amounts of the thyrotropic hormone of the anterior hypophysis. Large doses of pregnancy serum produced an effect on the thyroid in experimental animals. Pregnancy causes no thyrotoxic changes. An existing exophthalmic goiter becomes exacerbated by pregnancy in about half of the cases and terminates fatally in about 6 per cent. Some authors have even observed improvements in thyrotoxicosis during pregnancy. The author emphasizes that the increased thyroid activity during pregnancy is not a pathologic condition but is rather advantageous for the organism; it does not require compensation by other endocrines but helps in the undisturbed development of the growth processes of pregnancy. He stresses that it is inadvisable to refer to the increased thyroid action of pregnancy as a form of hyperthyroidism, for hyperthyroidism indicates a pathologic process.

Deaminating Function of Human Placenta.—Botella-Llusiá shows that the placenta has the capacity to decompose amino acids and to form ammonia and urea. This capacity is found in mature as well as in immature placentas, but its peak is reached during the seventh month of pregnancy. This activity does not necessarily have to be regarded as a vital characteristic; at any rate, it is of great interest in the explanation of metabolic disturbances during pregnancy.

Adrenal Cortex and Sexuality. — Neumann shows that insufficiency of the adrenal cortex is followed by a reduction of the sexual functions, which finally results in gonadal atrophy and, in women, in amenorrhea. He cites the case of a woman with Addison's disease in whom the cyclic sexual function was disturbed. The uterine mucosa was atrophic as in a woman at the onset of the menopause. After treatment with adrenal cortex extract and with *l*-cevitamic acid the menstruation was once more regulated. In addition to an improvement in the general condition there was also a decrease in the brownish discoloration. Hyperfunction of the adrenal cortex may produce premature puberty in children, and virilism (interrenalism) may result in girls of pubertal age. In male persons a change in the sex characteristics is rare. The author describes three cases of hypernephroid blastomas of the adrenal cortex, which he observed. In one case he observed a decided virilism, which, however, disappeared again following surgical removal of the adrenocortical tumor. Subsequently the woman became pregnant and gave birth to a living child. The author discusses hypernephroid blastomas in the region of the female genital organs and cites three cases. In one the urine produced in infantile mice anterior pituitary reactions I, II and III, but after the operation the elimination of the anterior pituitary hormone decreased because only reaction I was elicitable with the urine. In discussing the manner in which a hyperfunction of the adrenal cortex effects a change in the sex characters, the author suggests that the adrenocortical hormones act on the genital apparatus by way of the hypophysis.

Deutsche medizinische Wochenschrift, Leipzig

62: 717-756 (May 1) 1936. Partial Index

Hormones and Cancer. H. Druckrey.—p. 717.
Testing of New Cholagogue Substance with Duodenal Tube. W. Hoeffding.—p. 721.
Action of Short Wave Irradiation. G. Wetzel and A. Kiesselbach.—p. 725.
*Presence in Serum of Cancer Patients of Substance That Binds Melanophore Hormone. W. Rodewald.—p. 726.
Early and Erroneous Diagnosis of Atrophy of Optic Nerve: I. Partial Atrophies of Optic Nerve. L. Heine.—p. 727.
*Function and Functional Disturbances of Pancreas. Z. von Bernáth.—p. 730.

Substance in Serum of Cancer Patients That Binds Melanophore Hormone.—Rodewald points out that Trendelenburg and other investigators found that the serum of pregnant women contains a substance which counteracts the melanin diffusing component of the posterior lobe of the hypophysis in its action on the skin of the frog. Further investigations revealed that this inactivation is the result of a binding of the melanophore hormone to a high molecular protein substance. The author observed in experiments that the serum of cancer patients produces an even greater inactivation than does the serum of pregnant women, for, whereas frogs kept on a white ground assumed a somewhat darker shade after a mixture of normal or pregnant serum and extract of posterior pituitary had been injected, the frogs retained an almost unchanged light color when cancer serum was used in the test. Moreover, whereas the inactivating substance in the blood of some normal and of pregnancy bloods can be destroyed by heat (thirty minutes at 55 C.), the inactivating substance in

the serum of cancer patients is not destroyed by this treatment. The author tested the inactivation of the melanophore hormone on 385 serum specimens and gives a tabular report of the results. Of the serums from 109 cancer patients, all but four exerted a pronounced inactivating effect. The serum of patients with skin cancers, however, exerted no influence on the melanophore hormone. Among the serums of the 276 patients who had various other disorders but no cancer, seventeen reacted like cancer serums.

Functional Disturbances of Pancreas.—Von Bernáth investigated the external and internal secretion of the pancreas in fifty patients with various internal diseases. He examined the external secretion by determining the trypsin and diastase content of the duodenal juice and the lipase content of the blood and urine. To determine the condition of the internal secretion, he studied the course of the alimentary hyperglycemic reaction. He gives the normal values of the various pancreatic ferments and then states his observations on the pancreatic function in various disorders. He found that the pancreatic function was not noticeably impaired in patients with exophthalmic goiter. In diseases of the gallbladder he noted hypofunction of the pancreas. Chronic gastritis is followed by a disturbance in the pancreatic secretion, particularly in the cases in which the gastritis changes into achylia. The studies revealed also that the disturbances in the external and internal secretions of the pancreas are entirely independent from one another.

Deutsche Zeitschrift für Chirurgie, Berlin

246: 641-784 (April 22) 1936. Partial Index

*Spondylosis (Spondylitis) Deformans of Cervical Vertebrae. G. Ober.—p. 666.
*Dupuytren's Palmar Fascia Contracture and Its Treatment. G. Maurer.—p. 685.
Operation for Dupuytren Contracture. H. von Seeman.—p. 693.
Effect of Operative Trauma on Pulmonary Respiration, Capillary Gas Exchange and the Circulating Blood Volume. E. Derra.—p. 697.
Pulmonary Tension, Atelectasis and Lung Shrinkage. K. Strauss.—p. 715.

Spondylosis Deformans of Cervical Vertebrae.—According to Ober, the occurrence of spondylitic alterations in the cervical vertebrae is quite common. The lesions increase with age both in numbers and in severity. A predilection for the male sex was not noted. Three stages of the process are recognizable: (1) isolated calcification of the anterior ligament of a vertebra, (2) deposition of osteophytes at the point of insertion of the anterior ligament and (3) deformity of an individual vertebra. The interdependence of the three stages can be best observed in vertebrae the seat of an advanced lesion. Here one can see, as a rule, the three types of lesions with intermediary transitional stages. A vocational predisposition to the disease cannot be established. On the other hand, an etiologic relationship to infections such as furunculosis, gonorrhea, abscessed teeth, osteomyelitis or tonsillitis appears quite probable. The author found no relationship between the severity of the objectively demonstrable anatomic lesions and the objective clinical symptoms and the subjective complaints. The painful subjective manifestations of the disease arising from purely mechanical causes are to be attributed to a superimposed inflammatory process. In the absence of an inflammatory process, most advanced lesions may exist without clinical manifestations. The favorable response to irradiation is explainable on no other than the inflammatory genesis of the clinical manifestations.

Treatment of Dupuytren's Contracture.—Maurer presents a study of 200 cases of palmar fascia contracture observed at the Lexer clinic (Munich) during the last decade and among the inmates of the large Munich homes for the aged. He concludes from a review of the literature that of the many etiologic causes advanced trauma and heredity are the ones to be considered. The condition is much more common in men than in women. In his material there were 143 male patients (71.5 per cent) and fifty-seven female (28.5 per cent). The greatest incidence is in people past the age of 50. Chronic occupational traumatization of the palm of the hand is undoubtedly the principal etiologic factor in the causation of this disease. The author found that 55 per cent of his patients were engaged in occupations which exposed their palms to severe chronic trauma of various types, such as pulling, pressing or squeezing; 38 per cent were in occupations exposing their palms to ordinary trauma and 7 per cent were in occupations in which injury to the palmar surface was accidental. Both palms were involved in 107, the right alone in fifty-two and the left alone in forty-one cases. The frequent association with rheumatism, sciatica and gout is probably a coincidence rather than the result of a common "rheumatic or uratic diathesis." The claims made for the hereditary origin could not be verified in the author's material. He could trace this influence in only 10 per cent. He feels that Dupuytren's contracture should be classified as an occupational disease. The most successful treatment is that developed by Lexer, in which the entire palmar fascia with its apparently uninvolved prolongations is removed together with the overlying skin. The defect is repaired either by a free skin transplant or through the use of a pedicled attached flap fashioned out of the skin of the abdomen.

Klinische Wochenschrift, Berlin

15: 593-624 (April 25) 1936. Partial Index

Supplying Nursling with Vitamin C. K. Wachholder.—p. 593.
Experimental Studies on Refractory Period in Intestine. W. Catel and H. Mengel.—p. 597.
*Observations on Behavior of White Blood Picture in Pernicious Anemia. D. Hoffmann.—p. 598.
*Occurrence of Melanogen in Lung and Melanin Formation by Enzymatic Reaction. T. Sjöstrand and F. Sjöstrand.—p. 598.
Genesis of Embryonal Cardiac Activity on Basis of Hydraulic Pipe Phenomenon. I. Marcu.—p. 600.
Action of Musculature on Elasticity of Living Arterial Wall. A. Böger and K. Wezler.—p. 605.

The White Blood Picture in Pernicious Anemia.—Hoffmann reports observations on the white blood picture of fifty-seven patients with pernicious anemia. Some of the cases date back to the time before liver therapy was used, but in forty-one cases liver preparations were given. The total number of leukocytes was usually greatly decreased (from 2,000 to 3,500), but an increase in the hemoglobin content was usually accompanied by an increase in the number of leukocytes. In some instances the leukocytes reached highest values after the first administration of liver, but the number usually decreased again with the same rapidity and after that increased slowly simultaneously with the hemoglobin content. Whenever there was no blood crisis or remission, the leukocytes sank to extremely low values. In patients who were not treated with liver there was no increase in leukocytes except immediately after blood transfusions, whereas in those receiving liver therapy increased values were detected in about half of the cases, especially at the onset of a blood crisis. The author discusses the behavior of the various types of white cells with and without liver therapy. His observations indicate that the liver therapy of pernicious anemia exerts a practically specific action not only on the erythropoietic but also on the leukopoietic system. The action of liver preparations on the leukopoietic system is noticeable in all patients in whom the erythropoietic system is likewise improved, but in about 50 per cent of the cases it occurs later than the improvement in the red blood picture. In these cases the leukopenia, deviation to the right, lymphocytosis and monocytopenia are not compensated until the red blood picture has become partly or completely normal. The usually rapid increase in eosinophils, which sets in a few days after onset of the liver therapy, is an exception to this rule. In the other half of the cases, a deviation to the left appears soon after onset of the liver therapy and thus proves the prognostic value of the white blood picture. In the latter cases the specific action of liver therapy extends to the white blood picture from the beginning.

Melanogen in Lung and Melanin Formation by Enzymatic Reaction.—The Sjöstrands showed that the lungs of mammals and birds contain a type of cell characterized by its iron content and profuse granules, which consist of at least three different substances, which partly seem to change into one another. In the course of this transformation, which is dependent on the accumulation of blood in sinuous vessels, there develops a product which, under the influence of certain aldehydes by an enzymatic reaction, may be changed into a substance showing the behavior of the natural melanins. This substance can be obtained from the lungs in considerable quantities.

Wiener klinische Wochenschrift, Vienna

49: 545-576 (May 1) 1936. Partial Index

Origin of Hermaphroditism. L. Moszkowicz.—p. 545.
*Experimental Studies on Aujeszky's Disease (Pseudohydrophobia). F. Gerlach and F. Schweinburg.—p. 551.
Surgical Treatment of Tuberculosis of Bones, Joints and Lymph Nodes: Indications and Contraindications. M. Jerusalem.—p. 557.
Autoregulatory Processes in Nitrogen Metabolism. S. Leites and T. Wolpianskaja.—p. 559.
*Nature and Prevention of Traumatic Pneumonia. H. Reinberg and A. Kaplan.—p. 560.

Studies on Aujeszky's Diseases (Pseudohydrophobia).—Gerlach and Schweinburg describe experimental studies on pseudohydrophobia, which revealed that the virus of Aujeszky's disease is a latent neurotropic, filtrable virus. It is related to the virus of hydrophobia but differs from it fundamentally in many points. It seemed to be somewhat less resistant than the virus of hydrophobia to drying and chemical agents. The eight strains of virus of Aujeszky's disease which the authors examined differed considerably as regards virulence and incubation, but they all produced the clinical aspects of Aujeszky's disease. It proved possible to transmit the virus to experimental animals by all known modes of infection. Oral infection succeeded only in exceptional cases. In some cases the disease was transmitted by mere contact and occasionally by biting. After the disease has become manifest, the virus is always found in the brain and quite frequently also in the parenchymatous organs and in the blood. The virus was not demonstrable in the urine and in the stool, but in one case the disease was transmitted by means of the saliva of an infected cow. In rabbit passages the virus of Aujeszky's disease was constant, but successive passages in guinea-pigs and in rats reduced the virulence, and a subsequent rabbit passage increased the virulence again to the original degree. The immunization of healthy animals against Aujeszky's disease did not succeed entirely. Animals that have had an attack of the disease have a considerable immunity, which persists for at least nine months and perhaps longer. The virucidal action of the serum of these animals is only slight, but they tolerate subcutaneous and interperitoneal immunization quite successfully and thus aid in the production of highly virucidal serums. The animals thus treated have an immunity also against cerebral infection with the virus of Aujeszky's disease, but they are not in the least immune to hydrophobia. The virucidal serums are strictly specific in that they destroy even the strongest virus concentrations of Aujeszky's disease, but they do not neutralize even attenuated solutions of hydrophobia viruses. On the other hand, animals that are immune to hydrophobia are not immune to Aujeszky's disease.

Traumatic Pneumonia.—Reinberg and Kaplan are of the opinion that all pneumonias develop on the basis of an obstructive pulmonary collapse. After a bronchial lumen has been obstructed, the air in the corresponding pulmonary lobe is completely absorbed by the passing blood in about two hours. The authors mention the various factors that may cause obstruction of the bronchial lumen and then discuss the pulmonary mechanisms that aid in opening the bronchial lumen. They show that vigorous functional activity is of great importance in the prevention of pneumonia and that this is accomplished best by respiratory gymnastics in the sitting position and by carbon dioxide inhalation. They say that in this manner they were able to reduce the incidence of postoperative pneumonia as well as the pulmonary complications of typhus. In discussing traumatic pneumonia, the authors point out that in rib fractures, for example, the great pain at the sites of fracture leads to restriction of the functional activity and thus to deflation of the lung. During this state of deflation, a small quantity of bronchial secretion readily obstructs the lumen, and, since coughing is suppressed on account of pain, the secretion quickly accumulates. The authors realized that in order to facilitate respiration it was necessary to counteract the pain. They did this by injecting from 10 to 15 Gm. of a 1 per cent solution of procaine hydrochloride at the site of the fracture. This measure has a prompt effect. The existing cyanosis disappears and the patient is able to expel the secretion by coughing and to breathe properly. The authors employed this treatment in about forty patients with thoracic injuries, and in this manner they were able to prevent pneumonia.

49: 577-608 (May 8) 1936. Partial Index

Prophylaxis and Therapy of Postoperative Infection of Knee Joint. F. Mandl.—p. 577.
*Further Experiments with Specific Treatment of Erysipelas. E. Neuber. p. 581.
*Relations Between True Arterial Hypertension and Thyroid Function. M. Schur.—p. 589.
Coronary Insufficiency in Anemia. F. Mainzer.—p. 592.
Magnesium Sulfate in Strophanthin Intoxication. L. Zwillinger.—p. 594.
Prophylaxis and Suppression of Pneumonia by Ephetonin and Similar Substances. E. Löwy.—p. 595.

Specific Treatment of Erysipelas.—Neuber gives his attention chiefly to the use of convalescent serum. He found it advisable to give polyvalent convalescent serum; that is, a mixed serum from six or eight patients. Since the active substances in the convalescent serum quickly lose their efficacy at room temperature as well as in the icebox, he considers storage in the frozen condition advisable. He administers the convalescent serum by intragluteal injection. The serum is given at intervals of two or three days and in increasing doses. At the first injection between 40 and 80 cc. is administered. The author found that after the larger doses (from 60 to 80 cc.) the fever subsides more rapidly than after smaller doses (30 or 40 cc.). He observed also that the serums from patients who had not been given convalescent serum were more effective than those of other patients. Because of this he restricts the treatment with convalescent serum to the severe cases and uses as donors the patients who have the milder forms. He admits that mild relapses appear occasionally after treatment with convalescent serum; however, they usually disappear again spontaneously in a comparatively short time, but in order to avoid them he considers it advisable to give a few additional serum injections after the first attack has subsided. If the supply of convalescent serum is exhausted, after-treatment with chemotherapeutic substances (arsphenamine, quinine and so on) is advisable.

Arterial Hypertension and Thyroid Function.—Schur discusses the theories of the pathogenesis of hypertensive tachycardia. He shows that the majority of cases are accompanied by a considerable increase in the erythrocytes with vital granules. Tachycardia as well as the number of these erythrocytes usually decreases following the administration of di-iodotyrosine and increases again after this medication is discontinued. The author thinks that these observations are a further argument in favor of a hyperfunction of the thyroid in these cases. He agrees with J. Bauer, who assumes that an increased blood perfusion of the thyroid is responsible for this hyperfunction.

Wiener medizinische Wochenschrift, Vienna

86: 509-536 (May 9) 1936. Partial Index

*Experimental Cancer Immunity. A. Besredka and L. Gross.—p. 509.
Significance of Milk for Nutrition of Child. J. Siegl.—p. 512.
Treatment of Static Dynamic Decompensation by "Pelvic Lever" ("Scissors Lever Principle"). M. Jungmann.—p. 514.
*Rehabilitation of House Fly. H. Pach.—p. 517.

Experimental Cancer Immunity.—Besredka and Gross review some of the literature on this problem and describe their own experiments on rabbits. They reach the conclusion that rabbits are readily immunized against epithelioma. In order to produce this immunity it is sufficient to give an intracutaneous injection with a freshly prepared tumor suspension. The intracutaneous tumor that is produced in this manner soon becomes resorbed and the animal becomes immunized against epithelioma. This immunity is specific, solid and permanent, but it is not transmissible; that is, it is of a cellular nature.

Flies and Transmission of Typhoid.—Pach directs attention to a former report, in which he gave evidence to the effect that the theory according to which the house fly (Musca domestica) transmits typhoid is no longer tenable, because it contradicts the biology of the house fly and the epidemiology of typhoid. In this report he cites additional studies that were carried out under the supervision of the Hungarian hygiene institute and which he thinks are likewise evidence against the widely accepted theory of the carrier function of the house fly in the transmission of typhoid.

Vestnik Khirurgii, Leningrad

43: 1-184 (No. 119) 1936. Partial Index

*Leech Therapy of Embolic Processes. N. L. Blumental.—p. 3.
Transfusion of Conserved Defibrinated Blood. A. N. Filatov.—p. 11.
Numerical Estimation of Qualitative Alterations in Leukocytes Associated with Transfusion of Heterogenous Blood (Shock Therapy). B. A. Bogdanov.—p. 19.
*Treatment of Tetanus with Intraspinal Injections of a Mixture of a Solution of Phenol and Small Doses of Antitetanic Serum. T. A. Grasmik.—p. 30.
Enterostomy in Mechanical and in Paralytic Ileus. Z. B. Ogloblina.—p. 38.

Leech Therapy of Embolic Processes.—According to Blumental, the leech therapy of thrombophlebitis was proposed by Termier in 1922. In 1884 Haycroft found a substance in the secretion of the buccal glands of a leech to which Jacobi gave the name "hirudin." Experiments in vitro demonstrated that hirudin retards coagulation of the blood and that this effect is caused by its antithrombin action. It destroys the fibrin ferment without affecting the fibrinogen. Straaten believes that this effect is due not only to the anticoagulant action of hirudin but to prolongation of the bleeding time as well. Slowing of coagulation begins to take place from six to eight hours after the application of the leech, reaches its maximum in about thirty hours, and returns to normal in from forty-eight to fifty hours. The effect of hirudin is limited to a relatively small area in the vicinity of the applied leech. The rapid disappearance of edema following the application of leeches in acute thrombophlebitis is believed to be due to its lymphogenic action (Straaten). In addition, it possesses a bactericidal action which explains the rarity of infections after application of leeches to a skin not treated by antiseptics. A leech is capable of sucking from 15 to 20 cc. of blood. The puncture wound, after the leech has fallen off, continues to bleed for several hours. The amount of blood thus lost amounts to from 50 to 75 cc. The author sums up the effect of leech therapy on a thrombophlebitic process as follows: 1. Extension of the thrombotic process is arrested by the anticoagulant and absorbing action of hirudin. 2. The associated edema rapidly diminishes and disappears because of a lymphogenic action of hirudin. 3. The process is further favorably influenced by leukocytic and bactericidal properties of hirudin. As a result, the inflammatory process is aborted, the pain subsides and the infiltration is rapidly absorbed. The method to be followed in treating thrombophlebitis is to apply leeches in pairs alongside the inflamed vein about 2 cm. away from it on both sides of the vessel, at intervals of from 4 to 6 cm. From six to ten leeches may be applied. Hirudinization may be repeated every forty-eight to sixty hours. Two or three treatments are, as a rule, sufficient, but in exceptional cases from five to six may be required. The author treated thirty-two cases of acute thrombophlebitis, seven of which developed after an operation and two after delivery, three followed an infection, ten developed on a basis of varicose dilatation of veins, in five the process was an acute flare-up of a chronic thrombophlebitis, three were cases of acute inflammation of hemorrhoidal nodes and three were cases of acute thrombophlebitis of undetermined cause. The results were gratifying in all cases. The author concludes that hirudinization is the most effective treatment for thrombophlebitic processes.

Treatment of Tetanus.—Grasmik treated three cases of tetanus by intraspinal injections of from 4 to 5 cc. of a 3 per cent solution of phenol and noted good results. Two of the patients survived and one died. In the next six cases he injected the same amount of phenol together with 1,500 units of antitetanic serum. All patients recovered. The difficulty of the intraspinal method in the presence of opisthotonos is met by a preliminary administration of morphine and local anesthesia. Objective improvement was noted several hours after the injection. From his animal experiments the author concluded that treatment of tetanus with injections of phenol alone is not permissible. The antitetanic serum is effective only when introduced into the spinal canal. The combination of phenol with small doses of the antitoxin gives good results. The rôle of phenol is that of a nonspecific irritant of the central nervous system, while the antitoxin exerts its specific influence. Thus, the combination therapy renders it unnecessary to employ large doses of the antitetanic serum.

43: 195-317 (No. 120) 1936. Partial Index

Problems of Clinical Medicine and Experimental Endocrinology. A. Z. Kozdoba.—p. 195.
Traumatic Asphyxia. A. N. Zebold and S. P. Feldman.—p. 206.
Experimental Observations on Effect of Transfusion of Partly Coagulated Blood After Removal of the Coagula. I. P. Petrov and G. Kasumov.—p. 214.
Pulmonary Suppuration. V. V. Lavrov.—p. 230.
*Embolism of Superior Mesenteric Artery. N. S. Okun.—p. 240.

Embolism of Superior Mesenteric Artery.—Okun reports eleven cases of embolism of the superior mesenteric artery. There were eight instances of this condition among 2,332 necropsies. The condition was not diagnosed in a single case before the operation or necropsy. The etiologic factors in nine cases were acute, recurring, ulcerative, vegetative and chronic endocarditis and atheromatosis of the aorta. While the diagnosis is difficult, the presence of pathologic alterations in the cardiovascular system constitutes a valuable aid in the diagnosis of the condition. The pathologic alteration in the intestine is that of a hemorrhagic infarct and only rarely that of an anemic infarct. The clinical manifestations are those of diarrhea, ileus, or a combination of the two. Three of the author's cases were characterized by diarrhea, three presented a picture of intestinal obstruction, one presented symptoms of both diarrhea and ileus, while the rest presented a vague symptomatology. All patients died. An early operation with resection of the involved intestine is the only method offering a possibility of cure.

Bibliotek for Læger, Copenhagen

128: 83-102 (April) 1936

*Number and Percental Apportionment of White Blood Corpuscles in Suppurative Coloproctitis. O. Moltke.—p. 83.
Clinical Investigations into Action of Protamine Insulinate. N. B. Krarup.—p. 97.

White Blood Corpuscles in Suppurative Coloproctitis.—Of the twenty cases of suppurative coloproctitis examined by Moltke, seven proved fatal. In these leukocytosis was sometimes found, but there was a constant considerable, sometimes exceptionally high, increase in the immature neutrophil cell elements, both relatively and absolutely. In eleven cases of more or less grave disorders, none fatal, the values could rarely be designated as leukocytosis; in most cases there were slight shiftings to the left. Two patients, examined during periods of remission, showed neither leukocytosis nor shifting to the left. The author consequently considers constant more marked shifting to the left (i. e., relative values above 25 per cent and absolute count of more than 2,000) an important and grave prognostic sign. Reduction in shifting to the left is observed coincident with clinical improvement. A relative and absolute leukopenia occasionally appears in grave cases; it is apparently affectible by blood transfusion. Eosinophilia may occur, but it is not a constant phenomenon in suppurative coloproctitis.

Finska Läkaresällskapets Handlingar, Helsingfors

79: 295-390 (April) 1936

*Otogenic Meningitis, with Especial Regard to Pathology of Disorder. H. Björk.—p. 304.

Otogenic Meningitis.—Of Björk's twenty-nine cases of otogenic meningitis in acute otitis in which treatment was administered from 1930 to 1935, sixteen represented primary and thirteen secondary meningitis. Of the former, thirteen were tympanogenic (four fatal) and three labyrinthogenic (two fatal). Of the latter, eleven resulted from sinus thrombus (six fatal) and two from brain abscess (both fatal). Two of the fourteen deaths were caused by other complications, and the mortality from meningitis was thus 44.4 per cent. The nine cases in which there were bacteria (streptococci) in the cerebrospinal fluid were all fatal. The author concludes that meningitis in connection with acute otitis originates equally often from primary and from secondary infections. The great majority of cases are due to a tympanogenic or a sinusogenic infection. Disturbances in development play an important part in the progression of the disorder to the meninges; in twenty-six of his twenty-nine cases there was an abnormally wide or an obstructed pneumatization.